Human Language as a Self-Rewriting Social Protocol: A Meta Definition Across Epistemic, Logical, and Social Bands

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December 4, 2025

What, exactly, is human language? Traditional answers emphasize structure: duality of patterning, recursion, displacement, or the discreteness of sounds and signs. Others emphasize function: communication, thought, coordination, or identity. Yet these descriptions often miss something essential about the way language behaves over time: humans do not just use language, they continually rewrite it. Words shift, categories fracture and recombine, norms of use are debated, and even the concept of "language" itself becomes an object of discussion. This paper develops a novel meta definition: human language as a self-rewriting social protocol for managing shared reality. On this view, utterances are moves in a dynamic game that simultaneously tracks who knows what, what follows from what, and who is related to whom. The protocol is powerful enough to express truth-evaluable propositions, question them, combine them with basic logical operations, and situate persons within a web of social relations—while also allowing its own rules and categories to be described and modified from within. By framing language as a self-updating protocol that spans epistemic, inferential, and social bands, this paper aims to bridge structural and functional accounts, and to offer a testable, cross-domain criterion for recognizing "human-grade" language in humans, machines, or hypothetical non-human minds.

Keywords: human language, meta definition, self-rewriting protocol, shared reality, epistemic band, inferential band, social band, questions, logic, kinship, metalanguage, language change, communication systems, AI language, alien language.

A collaboration with GPT-5.1-Thinking-Extended. 59 pages. CC4.0.

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1. Introduction: From Descriptions of Language to Language as Protocol

Human language has been described in many ways: as a system of signs, as a vehicle for thought, as a code for transmitting information, as a marker of identity, as a cultural artifact. Each of these descriptions captures something important, yet all of them stop just short of what is most distinctive about language as humans actually live it. We do not merely inherit a fixed system; we inhabit and continuously alter a protocol that governs how we coordinate minds and worlds together. Language is at once the medium, the rulebook, and the workshop in which the rulebook itself is rewritten.

This paper proposes a meta definition of human language that foregrounds this self-modifying character. Rather than treating language as a static structure or a single-purpose tool, it frames language as a self-rewriting social protocol for managing shared reality. On this view, the most basic linguistic phenomena—making assertions, asking questions, drawing inferences, naming relations—are not isolated functions but tightly coupled strands in a dynamic process: humans using signals to adjust not only their beliefs about the world, but also the categories, norms, and even the linguistic tools by which those beliefs are expressed.

The path into this meta definition begins from three simple but revealing questions: can a language fail to ask questions? can it fail to express basic logical relationships such as those captured in truth tables? can it fail to talk about basic family relations? Exploring why the answer appears to be no in each case helps surface deep invariants of human language and motivates a more synthetic account.

1.1 Motivations for a meta definition

Attempts to define human language tend to accumulate lists. Some lists emphasize structural features such as duality of patterning, displacement, recursion, and compositionality. Others emphasize functions: communication, social bonding, coordination of action, or the externalization of thought. These lists are useful, but they typically treat language as if it were an object with properties, rather than a process that is reflexively aware of, and able to modify, those properties.

There are several motivations for moving to a meta definition:

First, language is not merely used to describe the world; it is used to describe itself. Speakers talk about words, argue about definitions, label certain utterances as polite, offensive, technical, or obsolete, and deliberately coin new terms. This reflexive capacity is not an optional extra but a pervasive feature of linguistic life. Any adequate definition should make this self-referential, self-modulating aspect central rather than peripheral.

Second, language does not just encode a pre-given reality. It is one of the primary mechanisms by which communities construct and negotiate their shared reality. When a word changes meaning, when a new category is introduced, when a kin term is reinterpreted, the social and conceptual landscape shifts. A definition that treats language purely as a mapping from sounds to meanings underestimates the extent to which it is a protocol for co-authoring those meanings.

Third, in an era of artificial intelligence and speculative discussions of possible non-human languages, there is a practical need for criteria that distinguish full human language from other symbolic systems. A meta definition can serve as a diagnostic: it can specify which capacities a system must have—not only in terms of structure or local function, but in terms of how it can operate on itself—to qualify as "human-grade" language.

Finally, a meta definition opens a bridge between disciplines. Linguistics, philosophy of language, cognitive science, anthropology, and AI each emphasize different facets of language. A view of language as a self-rewriting social protocol, spanning epistemic, inferential, and social domains, offers a common frame in which these perspectives can be related rather than merely juxtaposed.

1.2 Limits of structural and purely functional accounts

Structural accounts of human language catalogue formal properties: phonological systems built from discrete units, morphological paradigms, syntactic recursion, hierarchical phrase structure, and so on. These accounts illuminate the internal organization of linguistic systems and the ways in which a finite set of elements can generate an unbounded set of expressions. Yet when taken alone, they risk portraying language as a static object, like a complex machine, rather than as a living protocol that its users continually reconfigure.

Purely functional accounts, by contrast, focus on what language is for. They stress communication, coordination, information transfer, or social signaling. In their more minimal form, they reduce language to a code: a way to get a message from sender to receiver. In richer forms, they emphasize language's role in constructing identities, maintaining group cohesion, or scaffolding complex cognition. These perspectives rightly insist on language's embeddedness in social and cognitive life, but they often underplay its reflexivity and its capacity to alter its own constraints.

Both structural and functional accounts face similar limits when asked to explain phenomena such as:

- how communities coin, negotiate, and stabilize new terms for emerging realities
- how semantic shifts propagate, including the reappropriation or tabooing of terms

- how speakers consciously modify their language to include or exclude certain groups
- how specialized registers and jargons emerge, are contested, and are sometimes dismantled

These are not just sociological curiosities layered on top of a fixed core; they reveal that language's "core" is itself historically and socially active. The structures and functions that classic definitions rely on are products of an ongoing self-modifying process. A definition that ignores the meta-level—language's own talk about and change of itself—will always be one step behind the phenomenon.

A protocol-based view responds to this limitation by shifting focus. Instead of asking only what the syntax looks like or what the communication channel carries, it asks: what are the recurring types of moves that language permits, how do these moves interact, and how can the repertoire of moves itself be expanded, constrained, or redefined by those same moves?

1.3 Three probing questions as diagnostic tools

The path to a meta definition can be clarified using three deliberately simple questions:

1. Are there human languages in which questions cannot be phrased?
2. Are there human languages in which the basic logic of truth tables cannot be phrased?
3. Are there human languages in which basic family relations such as mother, father, brother, sister cannot be phrased?

Each question isolates a different dimension of what language must be able to do.

The first question targets the epistemic dimension. Interrogatives are not ornamental; they are the primary device by which speakers mark gaps in knowledge and request specific repairs. A "language" that could state facts but could not conventionally mark an utterance as a request for information would lack a mechanism for structured epistemic interaction. As far as is currently known, no human language lacks interrogative resources. Even where there is no dedicated question particle or special word order, intonation, particles, and contextual cues form a conventional system for distinguishing questions from statements.

The second question targets the inferential dimension. Truth tables are a simple formal device for representing the behavior of logical connectives such as and, or, not, and if…then. Natural languages need not lexicalize every possible Boolean connective, but they must, in principle, be able to express the kinds of distinctions those tables capture: that some combinations of propositions make a compound statement true, others make it false, and these patterns can be described. If speakers cannot say things equivalent to "if P and Q, then R," "not both P and Q," or "in the case where P is true and Q is false," then their system is missing basic tools for

reasoning about possibilities, conditions, and consequences. Again, available evidence suggests that every human language can, at least periphrastically, express these relations.

The third question targets the social dimension. Kinship terms are not just labels; they are compressed encodings of complex social information: descent, marriage, obligation, authority, affection, taboo. Languages vary widely in how they partition the family space, but all appear to be able to express at least basic parent–child and sibling relations. A system that could not linguistically distinguish or even describe such relations would fail to anchor its users in the social graph that shapes human life.

Together, these three questions function as diagnostic tools. They suggest that any system worthy of the name "human language" must be able to participate in:

- epistemic management (through questions and answers)
- inferential structuring (through truth-evaluated propositions and their combinations)
- social graphing (through terms and constructions that map persons into relations)

They also hint at a fourth dimension: the meta level. In practice, languages can not only use questions, logic, and kinship; they can talk about what counts as a good question, what counts as a valid inference, what counts as a family, and how the terms should be used. The meta definition in this paper builds directly on this observation.

1.4 Overview of the argument and structure of the paper

The remainder of the paper develops the view of human language as a self-rewriting social protocol in a series of steps that build on the motivations and diagnostics just sketched.

Section 2 reviews classical views of human language, both structural and functional. It outlines key concepts such as recursion, compositionality, duality of patterning, and displacement, as well as standard functional themes like communication and social bonding. The section highlights what these views explain well and where they begin to strain when confronted with the reflexive, historically shifting nature of language.

Section 3 introduces the notion of language as social protocol, emphasizing utterances as moves instead of mere messages. It draws on ideas of speech acts and conversational games to show how statements, questions, directives, and other act types can be seen as standardized operations on a shared informational and normative landscape.

Section 4 foregrounds the self-rewriting property. It examines how languages host metalanguage, how communities enact norm change through talk, and how explicit reflection on words and rules feeds back into everyday usage. Self-rewriting is then argued to be a defining, not incidental, feature of human language.

Section 5 presents the three invariant bands—epistemic, inferential, and social—more systematically. It argues that the earlier diagnostic questions reveal necessary capacities: the ability to manage knowledge, to structure inference, and to encode social relations. These bands together provide a functional skeleton that any human-grade language must flesh out.

Sections 6, 7, and 8 each focus on one band in detail. The epistemic band section examines interrogatives and evidential marking; the inferential band section explores how natural languages handle propositions, connectives, and conditionals; the social band section studies kinship and role terms as central ways of mapping the human graph.

Section 9 then offers a formal sketch of the meta definition. It states language as a self-rewriting social protocol and articulates necessary conditions in terms of productivity, propositionality, the three bands, and explicit meta-capacity. It also proposes informal "axioms" and simple tests for detecting whether a symbolic system meets these criteria.

Section 10 contrasts human language with other symbolic and signaling systems: animal communication, formal logics, and programming languages. These comparisons sharpen what is distinctive about the meta definition and show how some systems approximate parts of it without fully realizing it.

Section 11 explores implications for AI and hypothetical non-human languages. It asks how large language models and other artificial systems measure up against the meta definition, what it would mean for a system to satisfy the self-rewriting protocol criteria, and how such a lens might guide the search for alien or artificial languages.

Section 12 addresses objections and alternative framings. It considers whether self-rewriting is truly necessary, whether the three bands are exhaustive, and whether a sufficiently rich but rigid code might still deserve to be called a language. It also suggests possible extensions, such as affective or ritual bands.

Section 13 concludes by returning to the central image of humans living inside a self-updating protocol. It summarizes the advantages of the meta definition, reflects on how it recasts questions about language change and universals, and outlines open questions for further work across linguistics, philosophy, and AI.

The overall trajectory is from familiar descriptions of language as structure or tool toward a more encompassing view of language as a protocol that humans use not only to manage reality, but to continuously renegotiate what counts as reality, what counts as language, and who counts as "we."

2. Classical Views of Human Language

Before reframing language as a self-rewriting social protocol, it is useful to review the classical pictures that dominate linguistics and adjacent fields. These pictures have been extraordinarily productive: they motivated decades of empirical work, inspired formal models, and shaped how language is taught, engineered, and theorized. Yet they share a common limitation: they tend to treat "language" as something that can be fully described at a fixed time slice, with its deeper dynamics and self-modifying tendencies treated as secondary phenomena.

This section surveys the major structural universals associated with human language, the functional stories told about what language is for, the influence of the Chomskyan paradigm and its successors, and finally where these traditional definitions begin to fall short once we shift attention to the meta level of language describing and modifying itself.

2.1 Structural universals: duality, discreteness, recursion, displacement

Structural approaches to human language start from the observation that linguistic systems everywhere share certain formal properties, despite enormous surface diversity. These properties are often called design features or universals and have been used both to distinguish human language from animal communication and to unify linguistics as a comparative discipline.

One core structural universal is duality of patterning. Languages combine a relatively small set of meaningless units, such as phonemes or manual features in sign languages, into larger units that do carry meaning, such as morphemes and words. The lower level contributes combinatorial richness without semantic weight; the higher level carries semantic distinctions built from these phonological or gestural atoms. This two-tier architecture allows a finite inventory of sounds or signs to support a vast lexicon.

Another structural feature is discreteness. Linguistic units are treated as distinct categories rather than continuous gradations. A small acoustic difference can flip a phoneme from one category to another, changing meaning, while within-category variation is ignored. This discretization underwrites stability in the face of noisy channels: listeners recover intended categories, not raw physical detail.

Recursion is often highlighted as the engine of linguistic infinity. Through recursive rules, phrases can contain phrases of the same type: clauses embedded within clauses, possessive phrases nested inside other possessives, and so on. Recursion allows for unbounded hierarchical structures in principle, even if performance limitations constrain actual usage.

Displacement is another classical feature: language can refer to entities, events, and states that are not present in the immediate sensory environment. Speakers can talk about the past and

future, hypothetical or counterfactual situations, and abstract entities. This capacity breaks the here-and-now tether that characterizes many animal signaling systems.

These structural universals are powerful organizing ideas. They explain how language can be both finite in resources and unlimited in possible expressions, how it can maintain stability across noisy transmission, and how it can reach beyond the immediate situation. However, they primarily describe what the language system looks like at a given moment and how expressions are built, not how the system talks about and changes itself over time. The self-rewriting dimension remains largely implicit.

2.2 Functional stories: communication, thought, coordination, identity

In contrast to structure-focused accounts, functional approaches ask what language is for. They highlight how language operates in social and cognitive ecologies rather than focusing solely on internal form.

A straightforward functional story casts language as a tool for communication: a way to transmit information from one mind to another. On this view, speakers encode messages, listeners decode them, and the primary function is efficient transfer of information. Refinements of this story add layers: language manages not just factual information but also intentions, emotions, and social stances.

Another functional line of thought emphasizes language as an instrument of thought. Here, linguistic structures are seen as scaffolds for complex reasoning, abstraction, and reflection. Language allows us to manipulate propositions explicitly, rehearse alternative possibilities, and chain inferential steps. In this view, language is not merely a vehicle for pre-formed thoughts but an active medium in which thoughts are shaped.

Coordination is a further theme. Language is a tool for aligning actions and expectations: giving instructions, negotiating agreements, planning joint activities, maintaining shared projects. It reduces uncertainty about what others will do and makes large-scale cooperation possible.

Language also serves as a marker of identity and group membership. Dialects, accents, vocabulary choices, and registers signal affiliation, status, and distance. Language can both forge in-groups and reinforce boundaries, carrying cultural memory and norms.

These functional stories capture important aspects of what language accomplishes in human life. Yet they tend to treat functions as outputs of a relatively fixed system. They rarely foreground language's capacity to reconfigure those very functions by changing norms of usage, reassigning meanings, and introducing new categories. Communication, thought, coordination, and identity are not just served by language; they are continually reshaped by the way language rewrites itself.

2.3 The Chomskyan and post-Chomskyan landscape

Within modern linguistics, the Chomskyan program has been especially influential in shaping how language is conceptualized. It places competence—the implicit knowledge of an idealized speaker-hearer—at the center, and seeks to model this knowledge with formal grammars. The notion of a universal grammar, with language-specific parameters, frames language acquisition as the setting of these parameters on the basis of limited input.

This approach emphasizes internal structure: syntactic hierarchies, transformations, constraints on movement, and the interplay between syntax and semantics. It treats language as a biologically grounded cognitive system, a mental organ with its own principles. The focus is on what is innate, what is possible, and what is impossible in human grammars.

Post-Chomskyan developments have diversified the landscape. Some frameworks maintain a strong emphasis on formal syntax but revise the architecture or theoretical commitments. Others shift attention toward usage, frequency, and constructional patterns, seeing grammar emerge from repeated use. Cognitive linguistics, for example, stresses the embodiment of meaning and the role of metaphor and image schemas. Construction grammar treats linguistic knowledge as a network of form-meaning pairings at multiple levels of abstraction.

At the same time, pragmatics and discourse studies have grown, examining how context, intention, and interaction shape linguistic meaning. Conversation analysis, speech act theory, and related fields highlight the sequential organization of talk and the importance of local interactional norms.

Across this varied landscape, one can see a tension between viewing language as a stable mental system and viewing it as a situated, socially embedded practice. Even where change is acknowledged, it is often treated as a separate topic—historical linguistics, sociolinguistics—rather than integrated into the core definition of what language is.

2.4 Where traditional definitions fall short at the meta level

Structural universals, functional stories, and the Chomskyan and post-Chomskyan frameworks all provide partial but powerful pictures of human language. They explain how language can be combinatorial, unbounded, context-sensitive, and socially useful. Yet they generally take for granted that “language” is something that can be characterized by properties at a given time, even if those properties differ across communities and evolve historically.

What they do not center is the fact that language is continuously talking about and adjusting its own parameters. Speakers do not merely use language according to fixed rules; they incessantly comment on how it ought to be used, innovate, resist innovations, codify norms, and break them. Terms are declared offensive and retired, reclaimed and revalorized. New concepts are

coined and then fight for recognition. Grammars are written and then ignored, obeyed, or subverted. Styles, registers, and jargons emerge, become fashionable, and decay.

From a meta-level perspective, these phenomena are not epiphenomena on top of a stable core; they are expressions of a defining feature: language as a self-rewriting protocol. Traditional definitions rarely build this reflexivity into the essence of language. Instead, they append language change, meta-talk, and norm negotiation as additional topics. The result is a picture in which the most characteristically human aspect of language—the fact that its users can revise it from within—is conceptually downstream of a supposedly prior, more "basic" system.

Once we focus on the ability of a linguistic community to use language to describe, evaluate, and alter its own linguistic practices, the need for a meta definition becomes clear. Language is not merely a system with structural universals and functional roles; it is a living protocol that includes in its repertoire the tools for its own revision. Classical views lay essential groundwork, but they do not fully capture this self-modifying dimension. The next sections build on that groundwork to articulate language as a protocol that, in acting on the world, also acts continuously on itself.

3. Language as Social Protocol: Moves, Not Just Messages

If structural accounts invite us to see language as an intricate machine and functional accounts invite us to see it as a versatile tool, a protocol-based view invites a different metaphor: language as a rule-governed game played in real time among agents. In this game, utterances are not inert packets of information; they are actions that change what participants know, expect, owe, and permit each other to do. A sentence does not simply report a state of affairs; it updates a shared ledger of commitments and possibilities.

Thinking of language as a social protocol makes visible something that a purely code-based model obscures. In a simple code, messages are encoded, transmitted, and decoded, with success measured by fidelity of transfer. In a protocol, by contrast, the crucial issue is how each move shapes the unfolding interaction: which responses become appropriate, which paths are opened or closed, which norms are invoked or challenged. The significance of an utterance resides not only in its content but in its place in a sequence of moves and countermoves.

This section lays out the core of that perspective. It examines utterances as actions in an interactional game, surveys basic speech-act types as recurring move categories, frames shared reality as something negotiated through these moves, and argues that a fixed code model cannot capture this dynamic, self-modifying character.

3.1 Utterances as actions in an interactional game

In everyday conversation, people rarely behave like senders and receivers of static messages. They behave like players in a structured game, where each move is constrained by what has just happened and anticipates plausible continuations. When someone says “I’m sorry,” it is not just a report of an internal state; it is a reparative move that invites forgiveness, acceptance, or rejection. When someone says “I promise,” they do not simply describe a future action; they undertake an obligation.

These patterns are easier to see if we pay attention to sequences rather than isolated sentences. A greeting invites a return greeting. A question projects an answer or at least a response that acknowledges the request. An accusation projects a denial, an excuse, a counter-accusation, or some kind of uptake. The meaning of each turn depends on what it projects and how it positions the next speaker.

In this sense, language is organized as an interactional game with locally understood rules. Participants know, more or less implicitly, what counts as a relevant next move and what counts as an odd or disruptive one. They may break these expectations, but even that is a move: ignoring a question, changing the subject, or responding with sarcasm all carry interactional meanings.

The game metaphor does not trivialize language as entertainment. It emphasizes that linguistic life is structured, strategic, and path-dependent. Just as in a formal protocol between machines, where messages have predictable effects on the state of the system, human utterances change the normative and informational state of a conversation. Unlike machine protocols, however, human protocols are open to renegotiation from within. Participants can question the rules, invent new move types, and reframe what counts as an appropriate response. That is where the self-rewriting character of language begins to show.

3.2 Statements, questions, promises, and other speech-act types

One way to make sense of the interactional game is to classify moves by their illocutionary force: the kind of act they perform in virtue of being uttered. A statement, for instance, commits the speaker to the truth of a proposition. A question requests information. A command attempts to get the hearer to do something. A promise creates a forward-looking obligation. A threat combines a conditional prediction with an attempt at coercion.

These speech-act types are not merely philosophical abstractions; they are entrenched in ordinary practice. Children learn to distinguish asking from telling, promising from predicting, and joking from serious assertion long before they can articulate the distinctions explicitly. Social life depends on these differences. To confuse a threat with a warning, or a promise with a mere expression of hope, is to misread the game.

Crucially, the same string of words can realize different acts depending on context. “You’re coming” could function as a prediction, a command, or a question, depending on intonation and situation. This flexibility is not noise; it is part of the protocol. Participants use tone, timing, prior talk, and shared knowledge to infer the intended move type.

Moreover, new composite and specialized speech acts constantly arise: apologies, resignations, declarations of independence, pronoun announcements, content warnings, and countless other conventionalized moves. Many of these involve explicit meta-language; they talk about roles, norms, and categories. When someone says “I identify as…,” they are not simply reporting a static fact; they are performing a reconfiguration of how they wish to be addressed and understood, and inviting others to update their own practices.

The proliferation and evolution of speech-act types illustrate how language’s repertoire of moves is not fixed. Communities can introduce new types, refine old ones, and contest their legitimacy. The protocol is not only executed but also edited by its participants.

3.3 Shared reality as an ongoing negotiation

If utterances are moves, what exactly is the board they act on? One answer is that the board is shared reality: the continuously updated set of assumptions, commitments, and distinctions that a community takes as operative. This shared reality is not simply “what is out there”; it is “what we are, for now, treating as true, relevant, binding, or possible.”

Language is one of the primary means by which this shared reality is maintained and revised. When someone introduces a new term for a social category, they are attempting to alter the conceptual map. When a group refuses to use that term, they are resisting that alteration. When scientists agree to define a new concept in a certain way, they are making a coordinated move that will shape future discourse. When a government issues a declaration, it is attempting to reshape legal and political reality by linguistic fiat.

Even mundane conversations negotiate reality. Two people recounting the same event must converge, diverge, or bracket their disagreements. Through back-and-forth talk, they may decide that certain details are important, others trivial; that some interpretations are acceptable, others not. In this way, language does not merely describe reality; it co-authors it.

This negotiation is continuous. There is no final, settled map. Terms slide in meaning, narratives are revised, and norms are argued over. The protocol both presupposes and reshapes the ontology it operates over. That dual role is what makes human language a powerful medium for constructing worlds, not just transmitting information about them.

From the meta-definition perspective, the important point is that this negotiation is not performed from outside language. It is done in language, with the same resources used for

everyday description. The protocol is used to renegotiate its own categories, roles, and applicable realities.

3.4 Protocol versus code: why fixed mappings are not enough

A simple code model treats language as a mapping between messages and meanings. The core questions become: how are meanings encoded into signals, how do receivers decode them, and how can the channel be made reliable? This model is appropriate for certain engineered systems and some narrow aspects of human communication. It is ill-suited, however, for capturing language as a self-rewriting social protocol.

First, a fixed code presupposes a stable mapping between forms and meanings. In actual linguistic communities, mappings are constantly in flux. New words are coined, old ones repurposed, and meanings negotiated. These changes are not external accidents; they are outcomes of communicative moves. Speakers propose uses, others accept or reject them, and over time the mapping itself shifts.

Second, a code model typically abstracts away from interactional sequence and social roles. It focuses on isolated messages rather than on the organized patterns of turn-taking, repair, alignment, and resistance that give utterances their force. Yet much of what matters in language lies precisely in these patterns: whether an answer counts as responsive, whether a refusal is mitigated, whether a challenge is escalated or defused.

Third, a fixed code is usually designed and altered from outside. The rules for encoding and decoding are specified externally and then implemented. Human language, by contrast, is modified from within. Its users, by talking, create the very conventions they rely on. There is no separate engineering layer that sets the protocol; the protocol emerges and changes through its own operation.

Finally, a code is typically evaluated by its efficiency and clarity in transmitting predefined content. A protocol, especially one governing human interaction, must also be evaluated by how it manages power, inclusion, exclusion, and normativity. The same utterance can both transfer information and reposition a speaker in a hierarchy; the same term can both label a fact and stigmatize a group. These layered effects are inseparable in practice.

For these reasons, a fixed code is too weak a model for human language. What is needed is a conception that treats language as a living protocol of moves, one that can, through those moves, change itself. The next sections deepen this view by looking more closely at how language rewrites its own rules and at the invariant bands—epistemic, inferential, and social—through which this self-rewriting protocol operates.

4. The Self-Rewriting Property of Human Language

The protocol view of language becomes fully distinctive once we take seriously its capacity to act on itself. Human beings do not simply inherit a closed system of words and rules; they live in a medium where the system is continuously described, evaluated, and modified using its own resources. Children are corrected and in turn correct one another. Communities argue about which terms are acceptable, which pronouns should be used, what counts as a slur, and how new phenomena ought to be named. Specialists write grammars and dictionaries, but everyday speakers also legislate use through praise, ridicule, imitation, and refusal.

This self-rewriting property is so familiar that it can be easy to overlook. It is tempting to treat language change as a slow, background process, separate from the "real" business of communication. From the meta perspective, however, the ability of language to rewrite its own categories and norms is not a peripheral curiosity. It is one of the core features that distinguish human language from more rigid symbolic systems. It marks language as a protocol that is both executed and edited by the same community of users.

This section unpacks that property in four steps: metalanguage as language about language, norm change from within, the role of grammars and style guides as explicit meta artifacts, and the argument that self-rewriting is not marginal but definitional.

4.1 Metalanguage: talking about words, rules, and meanings

Metalanguage is language used to talk about language. It includes everything from explicit technical terms—noun, verb, subject, phoneme—to informal remarks like "that sounds rude," "we do not say it that way anymore," or "what does that word mean?" Whenever speakers mention words, constructions, accents, or meanings, they are operating in a meta mode.

This capacity appears early in acquisition. Children not only learn to use words; they quickly begin to ask about them: "What does X mean?", "Why did you say that?", "Is that a bad word?" These questions recruit the same interrogative and explanatory resources used for talk about non-linguistic objects, but their topic is the system itself. In responding, adults produce small pieces of folk grammar and folk semantics: "It means the same as…," "That's polite," "We only say that to close friends," "You need an -ed there."

Metalanguage is not confined to explicit commentary. Many everyday constructions are quietly meta. Quotation, for instance, allows speakers to bring words themselves into focus: saying "He said 'I'm leaving'" both reports an event and foregrounds a specific string of words. Irony and scare quotes allow speakers to distance themselves from terms even as they use them. Labeling moves—"call it X," "we use the term Y"—actively propose entries for the community's lexicon.

The presence of metalanguage means that the protocol includes within itself instructions for its own use, revision, and policing. Speakers can:

- define and redefine terms
- describe patterns and exceptions
- articulate rules and their justifications
- challenge others' usage and propose alternatives

This reflexivity is qualitatively different from a system whose rules can only be altered from outside, by a designer. It allows the user community to become, collectively, the maintainer of the protocol.

4.2 Norm change from within: redefinitions, taboo shifts, and neologisms

Metalanguage would be inert if it did not feed back into practice. In human languages, it does. Talk about words, rules, and meanings does not merely describe a static system; it alters it. This norm change from within is visible in at least three recurring phenomena: redefinitions, shifts in taboo status, and neologisms.

Redefinitions occur when a community adjusts the boundaries or connotations of an existing term. Sometimes this happens gradually, through repeated use in altered contexts. Sometimes it is more explicit: advocates argue that a word should be understood differently, that it excludes some people it ought to include or includes some people it ought to exclude, or that its default imagery is misleading. Over time, these arguments can succeed, producing new "standard" meanings that would have been unintuitive a generation earlier.

Taboo shifts illustrate the moral dimension of self-rewriting. Certain terms become unacceptable, at least in polite or public contexts. The reasons can be explicit—recognition of harm, changes in power relations—or more diffuse. In either case, the taboo is enforced and negotiated linguistically: people call out usage, apologize, self-censor, euphemize, reclaim, or resist. New euphemisms appear, themselves often destined to undergo the same cycle. The protocol changes its own list of prohibited strings and the social meanings attached to them.

Neologisms are the creation of new lexical items, phrases, and labels. They may name technological innovations, social identities, scientific concepts, or novel cultural practices. Some neologisms are coined deliberately, with explicit meta commentary. Others emerge playfully or locally, then spread. The community's judgment—expressed through uptake, repetition, ridicule, or indifference—determines which neologisms become stable parts of the protocol.

In all these cases, the mechanism is internal. There is no external authority flipping a switch; there are only speakers and writers using language to pressure other uses, frame alternatives,

and reshape expectations. The protocol rewrites itself through use. The new meanings, taboos, and words are not separate from language; they are language, as newly configured.

4.3 Grammars, style guides, and folk-linguistic reflection

Alongside everyday meta talk, there is a more explicit stratum of self-description: grammars, dictionaries, style guides, usage manuals, linguistic essays, and folk-linguistic commentary in public discourse. These artifacts crystallize metalanguage into semi-stable texts that can, in turn, exert substantial influence on practice.

Grammars and dictionaries systematize observations about a language's structure and lexicon. They often present themselves as descriptive, but their very existence can have prescriptive effects. Once a pattern is codified, it can acquire authority; deviations may be treated as errors rather than alternatives. The protocol acquires a partially explicit specification, and that specification becomes a new player in the game, invoked to justify corrections and reforms.

Style guides and usage manuals are more overtly normative. They recommend particular choices of word, construction, and punctuation for certain contexts. They articulate ideals—clarity, concision, formality, inclusivity—and propose linguistic means to achieve them. Users may follow or ignore these recommendations, but the guides provide a vocabulary for discussing and judging language use: clichés, mixed metaphors, passive voice, jargon, sexist language, bias-free terminology.

Folk-linguistic reflection goes further. Public debates about "correctness," "plain speech," "political correctness," "respectful language," "academic jargon," and other contested topics are not marginal. They are instances of the community explicitly negotiating what the protocol should be like. These debates are themselves conducted in language and often concern which acts and terms will be recognized as legitimate moves in particular domains.

The existence of such meta artifacts and discussions shows that language is not just used, but theorized by its own users. Theories feed back into practice: what is taught in schools, what is considered professional, what is seen as authentic or pretentious. The protocol carries around, within itself, more or less partial manuals of its own operation, written by participants and continually edited through further discourse.

4.4 Self-rewriting as a defining feature, not a marginal phenomenon

It might be tempting to treat all of this—metalanguage, norm change, grammars, style debates—as secondary. On this view, "real" language would be the underlying structural system and its basic communicative functions, while self-rewriting would be a sociocultural overlay. The meta definition advanced in this paper rejects that hierarchy. It treats self-rewriting as definitional.

There are several reasons for this stronger claim.

First, self-rewriting is pervasive. It is not confined to formal institutions or rare historical moments. Children negotiate slang. Friends co-create in-group expressions. Occupational communities develop and revise jargon. Online forums coin and recoin terms constantly. The protocol is being tweaked, stretched, and reinterpreted at every scale, all the time.

Second, self-rewriting affects not only vocabulary but also categories of personhood, obligation, and reality. When a community changes how it talks about a group, an illness, a technology, or an event, it is also changing how those things are socially understood and acted upon. A language that could not reconfigure such categories from within would severely limit its speakers' capacity for collective self-understanding and reform.

Third, self-rewriting marks a clear contrast with many other symbolic systems. Formal logics, programming languages, and communication protocols can change, but the change typically comes from outside the running system: from designers, standards committees, or spec authors. Users do not ordinarily revise the syntax of a programming language by writing code in that language. By contrast, ordinary speakers routinely participate in modifying their language's norms by using the language itself. The boundary between "user" and "designer" is blurred.

Finally, self-rewriting integrates the epistemic, inferential, and social bands that this paper emphasizes. Meta talk about what counts as a good question, a valid inference, or a respectful kin term is simultaneously epistemic, logical, and social. It is not an extra layer; it is where these bands meet. To leave it out of a definition of language is to miss the point at which language most clearly reveals itself as a protocol for managing shared reality, including its own structure.

For these reasons, the self-rewriting property is not just an interesting side effect of human linguistic behavior. It is a criterion for what counts as a human language in the strong sense articulated here. A system in which users cannot, from within, propose, contest, and reshape its own categories and norms using the system itself may still be a code, a calculus, or a signaling scheme. It is not yet the kind of self-updating social protocol that human language exemplifies.

5. Three Invariant Bands: Epistemic, Inferential, and Social

To call language a self-rewriting social protocol is to say that it operates simultaneously on several intertwined dimensions. Earlier sections suggested that three such dimensions are especially fundamental: how language manages knowledge and ignorance, how it structures propositions and consequences, and how it encodes persons and their relations. These will be called the epistemic, inferential, and social bands of the protocol.

The claim is not that all of language can be neatly partitioned into three independent modules. Rather, these bands are overlapping lenses that highlight necessary capacities. The diagnostic questions posed at the outset—about the possibility of languages without questions, without basic logical expressivity, or without kinship talk—already hinted that something like these three bands must be present in any human-grade language. Here they are treated more systematically, as invariant demands on any system that aspires to do what human language does.

5.1 The epistemic band: knowing, not knowing, and asking

The epistemic band comprises all the ways language represents, modulates, and interrogates states of knowledge and belief. Every assertion, question, hedge, and expression of doubt belongs here. At this band, language tracks what is known, unknown, believed, suspected, taken for granted, or challenged.

At the most basic level, the epistemic band is evident in the distinction between statements and questions. A statement presents a proposition as (for now) true or at least speaker-endorsed. A question marks that proposition, or some part of it, as unsettled and requests that it be settled. This is not a minor distinction: it structures the entire conversational game. Questions project answers or other forms of uptake; statements project agreement, disagreement, or qualification.

Natural languages richly elaborate this basic contrast. Many have morphological or lexical means to express evidentiality: whether the speaker knows something by direct perception, inference, hearsay, or assumption. Others distinguish degrees of certainty: perhaps, probably, definitely. There are conventions for hedging, for indicating that one is merely guessing, for signaling irony or pretense. All of these are ways of managing the epistemic status of propositions.

From the protocol perspective, the epistemic band is indispensable because it allows participants to coordinate not only on what the world is like, but on who is committed to what. If a system could only broadcast bare propositions with no conventional way to mark them as questioned, doubted, or weakly held, it would make structured joint inquiry nearly impossible. Informational updates would be indistinguishable from requests for information, and disagreements would be harder to locate.

The earlier question—whether there could be a language that cannot phrase questions—thus becomes a way of testing for the presence of an epistemic band. The empirical answer, so far as is known, is negative. Every human language has resources, sometimes subtle, for conventionalizing the difference between knowing and asking. This band is therefore not an

optional add-on but a built-in dimension of how language functions as a protocol for managing shared reality.

5.2 The inferential band: combining propositions and tracking consequences

The inferential band consists of the ways language connects propositions to one another: expressing conditionals, conjunctions, disjunctions, negations, explanations, and implications. It is through this band that language supports reasoning, prediction, and the exploration of alternative scenarios.

In formal logic, connectives such as and, or, not, and if…then are defined by truth tables that specify which combinations of input truth values yield which outputs. Natural languages do not mirror these truth tables perfectly. Everyday conjunctions and conditionals carry temporal, causal, and pragmatic nuances that go beyond pure truth-functionality. Nevertheless, language reliably supports expressions equivalent, in principle, to the core logical operations. Speakers can say that two propositions are both true, that at least one of them is, that a proposition is false, that one proposition depends on another, that some combinations are ruled out.

This capacity matters for the protocol because it allows participants to go beyond isolated facts. They can articulate rules, policies, and generalizations: if someone does X, then Y will happen; not both A and B can occur; whenever C is the case, D tends to follow. They can articulate dependencies and conflicts between commitments: if we accept P, we must also accept Q; we cannot keep both R and S without contradiction.

The earlier diagnostic question about a language that could not phrase the basic logic of truth tables was thus a test for an inferential band. A system that cannot represent even simple conditional structures and incompatibilities would be unable to support explicit reasoning about alternatives and consequences. It could still signal simple correlations or sequences, but it would lack the means to talk about why some combinations are impossible, risky, or obligatory.

In human languages, this band interlocks with the epistemic one. Speakers not only state that if P then Q; they also qualify how strongly they believe that conditional, how they know it, and under what conditions they might revise it. They ask questions about consequences, challenge inferences, and use logical structure as a site of negotiation. The inferential band thus provides the compositional scaffolding on which much of the protocol's higher-order activity depends.

5.3 The social band: persons, roles, and kinship structures

The social band encompasses the ways language identifies persons, marks their relationships, and encodes roles, statuses, and obligations. Pronouns, kinship terms, titles, honorifics, and many naming practices belong here. So do myriad subtle choices that align or distance speakers, such as terms of address, politeness markers, and registers.

At its core, this band allows speakers to say who is who and who is to whom. Kinship terms are a particularly studied example. Different languages carve up the family space in distinct ways, but all appear able to express basic relations such as parent and sibling. Beyond kinship, languages have resources for indicating social roles (teacher, judge, friend, neighbor), group memberships (citizen, member, ally), and relational stances (enemy, rival, partner).

These expressions do more than locate individuals in a static social graph. They often carry norms and expectations. To call someone a mother is to invoke not only a genealogical relation but a cluster of obligations and entitlements. To call someone a boss, comrade, or neighbor is to position them within networks of authority, solidarity, or proximity. Language thus serves as a primary interface between individuals and the social structures they inhabit.

The earlier question about a language that could not phrase basic family relations probed for this band. A system that can describe physical events but has no conventional means to express who is related to whom, or what roles individuals occupy, would be radically impoverished for human purposes. It might function as a limited descriptive code, but it would fail to support the negotiation of obligations, loyalties, and identities that shape human life.

The social band also interacts with the epistemic and inferential bands. Who is entitled to ask whom which questions, who has authority to assert certain propositions, and whose inferences carry weight are themselves socially mediated. Terms that encode social position affect how utterances are received. When language rewrites its own social categories—for example, by redefining kinship terms, inventing new identity labels, or revising titles—it is altering the protocol at this band.

5.4 Why these three bands jointly constrain any human-grade system

The epistemic, inferential, and social bands are not exhaustive of everything language can do, but together they capture a set of minimal requirements for a system to function as a human language in the strong sense advanced here. Each band corresponds to a distinct kind of coordination problem that human communities must solve, and language addresses all three at once.

The epistemic band addresses the problem of distributed knowledge. Individuals have partial, overlapping, and sometimes conflicting information and beliefs. A human-grade language must provide tools for expressing what is known, what is not, and what is being asked. Without this band, there can be no disciplined joint inquiry, no clear way to request or offer corrections, and no explicit management of uncertainty.

The inferential band addresses the problem of structured consequence. Human agents need to act not only on isolated facts but on patterns: rules, regularities, conditionals. A human-grade language must allow them to articulate such patterns, test them, and link them to specific cases.

Without this band, explicit reasoning about policies, plans, and hypothetical outcomes would be severely constrained.

The social band addresses the problem of joint life. Humans are embedded in networks of kinship, authority, solidarity, and conflict. A human-grade language must encode these relations and roles in ways that can be invoked, contested, and renegotiated. Without this band, individuals would lack a shared symbolic framework for articulating who they are to one another and what they owe.

Taken together, the three bands ensure that language can coordinate minds, actions, and identities. They are not independent modules; they interweave. A question about a conditional rule posed by a subordinate to a superior simultaneously occupies all three bands. So does a redefinition of a kinship term advanced in a public debate.

From the perspective of the meta definition, a system that fails to realize any one of these bands falls short of the human-language threshold. A protocol that lacks an epistemic band might transmit signals but cannot organize inquiry. One that lacks an inferential band might encode facts but cannot support generalization and planning. One that lacks a social band might describe a world of objects and events but cannot situate persons within it.

Moreover, the self-rewriting character of language manifests within each band and in their interplay. Communities redefine what counts as a legitimate question, a valid inference, or a respectful term of address. In doing so, they reshape the epistemic, inferential, and social contours of their shared reality. Any adequate account of human language must therefore treat these bands not as static capacities but as dynamic loci of ongoing renegotiation within a living protocol.

6. The Epistemic Band: Questions and the Management of Ignorance

Language does more than label the world; it also manages what is known, unknown, doubted, or disputed. This management happens along the epistemic band of the protocol, where utterances are positioned not just as content but as moves that display, conceal, or reshape knowledge states. Questions are central here. They are the primary devices by which speakers mark gaps in their own knowledge and solicit contributions from others. Around them grows a rich ecology of answers, hedges, evidential markers, and expressions of doubt or certainty.

Understanding human language as a self-rewriting protocol requires us to see interrogativity and epistemic stance not as minor grammatical details but as structural features of the game. Without conventional means to ask, answer, and grade commitment, the protocol would be

incapable of sustaining joint inquiry and revision. It would be a medium for announcements, not for collaborative truth-seeking.

6.1 Interrogativity as a universal capacity

Across known human languages, there are conventional ways to mark an utterance as a question. Some employ specific word orders, like inversion of subject and verb. Others use particles that signal interrogative force. Many rely heavily on prosody, using rising intonation patterns to mark questions distinct from statements. Some combine multiple cues. The forms vary, but the function is stable: speakers can package an utterance as a request for information rather than as a claim.

Questions themselves come in different types. Polar questions ask whether a proposition is true or false. Content questions ask for the value of some variable, using interrogative words glossed as who, what, where, when, why, and how. Alternative questions present a set of options, asking the addressee to choose among them. Within each type, languages make finer distinctions between open and leading questions, between genuine information requests and rhetorical questions that do not expect an answer.

This pervasive interrogative machinery reflects a basic need: individuals do not see all of reality, and they rely on others to fill in gaps. A protocol that can only assert would be like a broadcast channel with no way to signal uncertainty or request specific data. The universality of interrogative capacities is therefore not accidental; it is a manifestation of the fact that human language is built for distributed cognition, where knowledge is unevenly spread and must be actively pooled.

6.2 Question–answer dynamics and the repair of knowledge gaps

Questions are only half of the epistemic mechanism. Their force comes from the patterns of response they project and receive. In conversation, question–answer pairs form a basic unit of organization. A question makes certain kinds of next moves relevant and appropriate: an answer, a refusal, a clarification request, a deferral, or in some cases an overt display of inability to answer.

These dynamics are visible in the fine timing and structure of talk. An answer that comes too slowly may be heard as evasive. A response that does not match the type of the question may be heard as uncooperative or as an attempt to reframe the issue. Even silence, in the face of a direct question, is meaningful; it can signal resistance, discomfort, or lack of entitlement to speak.

From the perspective of the protocol, question–answer sequences are repair operations on knowledge gaps. The question explicitly marks a missing piece; the answer proposes a candidate

to fill it. If the answer is accepted, the shared informational state is updated. If it is challenged, further questions and arguments may follow. Over time, chains of such repairs build up a more articulated picture of some domain.

Importantly, this process is not purely factual. People ask not only about external states of affairs but also about each other's beliefs, intentions, and memories. Questions can probe commitments, test consistency, or reveal ignorance. They are tools for calibrating who knows what and who can be relied on as a source in particular areas. They thus shape the epistemic network of the community.

The self-rewriting aspect of language enters here as well. Communities can talk about what kinds of questions are legitimate, intrusive, or out of bounds. They can define norms about who may question whom and under what circumstances. These meta-discussions adjust the protocol's rules for knowledge repair and redistribution.

6.3 Epistemic stance, evidentiality, and degrees of commitment

Not every assertion carries the same weight. Language allows speakers to signal how strongly they are committed to what they say and on what basis they claim to know it. This complex field of epistemic stance includes markers of certainty, doubt, conjecture, and obligation, as well as evidential markers that specify the source of information.

Some languages grammatically encode evidential distinctions: whether the speaker saw something directly, inferred it from evidence, heard about it from others, or assumes it as common knowledge. Others rely more on adverbials and particles that loosely indicate source and reliability. Across systems, the effect is the same: speakers can position themselves as more or less authoritative, more or less tentative.

Hedges and boosters modulate this stance further. Words and constructions that convey perhaps, it seems, I think, or I am sure allow speakers to fine tune how their contributions should be taken. This tuning is not mere politeness; it is part of the epistemic protocol. It instructs hearers on how to integrate the new proposition into their own belief systems, how much weight to assign it, and how aggressively to challenge it.

Epistemic stance also interacts with questions. A question can be softened into a tentative inquiry or sharpened into a demanding interrogation. It can presuppose that the addressee knows the answer or present the speaker as equally uncertain. These nuances matter for how willing participants are to expose their ignorance, share what they know, and admit error.

Language's ability to express epistemic gradations is one of the main ways it manages the risks of being wrong. People can float hypotheses without fully endorsing them, express doubts without rejecting a claim outright, and retract statements without losing all credibility. The

protocol makes room for partial commitments and revisable positions, which is essential for any system that supports ongoing inquiry rather than only the exchange of certainties.

6.4 What would a "language" without questions fail to be?

Imagining a system that lacks questions helps clarify just how central the epistemic band is to human language. Suppose there were a code in which all utterances were structurally statements, with no conventional means to mark an utterance as a request for information. Could such a system serve as a human language?

In a narrow sense, individuals might still manage to convey their ignorance and desire for information through elaborate paraphrase, gesture, or reliance on context. They could say things like I do not know where X is and hope that others would respond by supplying the missing information. But without standardized interrogative forms, this would be an improvised workaround, not a built-in feature of the protocol.

More importantly, the system would struggle to support structured dialogue. If there is no clear type distinction between asking and telling, the expectations that drive turn-taking become opaque. It is harder to know when a response is owed, what kind of response would count as adequate, and when a topic has been satisfactorily closed. The fine-grained sequencing that allows conversations to converge on shared understandings would be severely impaired.

Such a system would also impede the explicit teaching and learning of knowledge. Teachers could present information but would lack straightforward ways to elicit specific gaps in students' understanding. Students could express confusion but not easily target particular pieces of missing knowledge. The iterative refinement that underlies education and expertise would be blunted.

Finally, a language without questions would cripple the self-rewriting capacity of the protocol itself. Many meta-linguistic moves are framed as questions: Is that the right word? Can we say it this way? Why do we call them that? These questions initiate episodes where norms and meanings can be examined and potentially altered. If the system cannot frame such moves as questions, its ability to deliberately review and revise its own practices is reduced.

For these reasons, a system without interrogative resources might function as a signaling scheme for reports or commands, but it would fall short of what this paper calls a human-grade language. It would lack a robust epistemic band, and with it, the capacity for sustained joint inquiry and intentional self-modification. Questions are thus not just one feature among many; they are an essential expression of language's role as a protocol for managing ignorance, knowledge, and their continual renegotiation.

7. The Inferential Band: Truth, Logic, and Compositional Space

The inferential band of language concerns how utterances hook together into patterns of consequence, compatibility, and incompatibility. If the epistemic band manages who knows what and who is asking whom, the inferential band manages what follows from what. It is where language moves beyond isolated statements about the world and into rules, conditionals, arguments, explanations, and counterfactuals.

Human languages are not formal logics, yet they systematically support something like logical structure. Speakers can treat some combinations of claims as impossible, others as required, and still others as merely permitted. They can articulate chains of reasoning, test hypothetical scenarios, and use language to manipulate not only descriptions but the space of possibilities they are embedded in.

This section explores that space in four steps: propositions as truth-evaluable units, the relation between everyday connectives and idealized Boolean operations, the ability of natural language to mimic arbitrary truth tables by paraphrase, and inferential sufficiency as a criterion for language-level cognition.

7.1 Propositions as truth-evaluable units in natural language

At the heart of the inferential band is the idea of a proposition: something that can be asserted, denied, questioned, or entertained as true or false. In natural language, propositions are typically realized as clauses or sentences. When someone says it is raining, they present a content that can be evaluated against the world, accepted, rejected, doubted, or treated as hypothetical.

Natural languages provide multiple ways to manipulate propositions as units. They can be embedded under verbs of saying, thinking, hoping, fearing, and knowing. They can be placed in conditional or temporal environments: if it is raining, when it is raining, although it is raining. They can be abstracted over in questions: whether it is raining, what is happening, why it is raining. In each case, something proposition-like is being passed around as an entity that can combine with others and be subject to logical relations.

The ability to treat propositions as such units is crucial for compositionality. It makes it possible to build complex structures whose meaning depends on how simpler propositions are connected. A statement like if it is raining and the temperature is below freezing, the roads will be icy presupposes that the clauses it is raining, the temperature is below freezing, and the roads will be icy are each available as truth-evaluable pieces that can be assembled.

From the protocol perspective, propositions are the tokens on the inferential board. They are the items whose configurations encode rules, generalizations, and evaluations. Without some

analogue of propositions, a system might still label objects or states but would struggle to support the sort of structured reasoning that human language routinely carries.

7.2 Everyday connectives versus idealized Boolean operations

Formal logic introduces connectives such as and, or, not, and if…then with precise truth tables. For instance, a idealized conjunction is true only when both input propositions are true; a standard disjunction is true when at least one input is true; a material conditional is false only in the case where the antecedent is true and the consequent false. These definitions provide a clean algebra of propositions.

Natural-language connectives resemble but do not perfectly match these idealized operations. Everyday and often implies not only conjunction but temporal or causal ordering: he ate and left suggests a sequence. Or is frequently interpreted as exclusive in context, even if inclusive readings are available. Conditionals introduced by if carry causal, epistemic, or pragmatic overtones that go beyond the bare truth conditions of the material conditional.

Despite these complexities, the underlying inferential role of connectives is recognizable. Conjunctions license inferences to each conjunct. Disjunctions license inferences that if one disjunct is false, the other must be true. Conditionals support reasoning about what would or will happen given certain circumstances. Negation reverses acceptance and rejection. Speakers are able, within their language, to reason in ways that approximate the patterns captured by logical calculi, even if pragmatic enrichment and world knowledge play a large part.

The divergence between everyday connectives and idealized Boolean operations is not a defect; it reflects language's dual role. On the one hand, it must support abstract reasoning. On the other, it must remain anchored in causal, temporal, and social expectations. The inferential band thus sits at an interface between pure logic and the messy world of experience. The important point for the meta definition is not that language behaves like a stripped-down calculus, but that it is powerful enough to express, refine, and critique such calculi when needed.

7.3 Expressing arbitrary truth tables via natural paraphrase

Even though natural languages do not lexicalize every Boolean connective with a single word, they can, in principle, express any truth-functional pattern by composition and paraphrase. This expressive capacity is a key part of what makes the inferential band robust.

For example, exclusive or can be expressed as either P or Q, but not both. A biconditional can be rendered as P if and only if Q, or more informally, P if Q and Q if P. Functions such as NAND and NOR can be paraphrased as not both P and Q or neither P nor Q. More complicated

combinations can be spelled out by enumerating cases: in situations where P is true and Q is false, R is true; otherwise, R is false.

These paraphrases may be cumbersome compared to compact logical notation, but their availability matters. It means that for any finite truth table defined over a small set of propositions, speakers can construct a natural-language description that captures the same pattern of outcomes. They can say, in effect, under exactly these conditions, this holds; under all other conditions, it does not.

This capacity is important for explicit rule-making and system design. Laws, contracts, scientific definitions, and protocols often specify conditions under which certain consequences apply. Natural language is the medium in which most of this specification happens. The fact that it can approximate arbitrary truth-functional structures means that the inferential band is not limited to a small repertoire of pre-packaged patterns; it can be extended on demand.

In the context of a self-rewriting protocol, this expressivity allows communities to articulate new inferential norms. They can define new operators, policies, or inferential shortcuts: whenever we say X, we will treat Y as implied; if conditions A, B, and C all hold, then we will do Z; in every case except when W, the default assumption should be Q. The protocol can thus not only host inference but also revise the rules of inference it endorses, all within natural language.

7.4 Inferential sufficiency as a criterion for language-level cognition

If the epistemic band led to the thought that a system without questions would fall short of human-grade language, the inferential band leads to a related criterion: inferential sufficiency. A system counts as having language-level cognition, in the sense used here, only if it can represent and manipulate propositions in ways rich enough to support structured reasoning about conditions, consequences, and incompatibilities.

Inferential sufficiency does not require that a system mirror any specific logical calculus. It does require that users can:

- form composite propositions from simpler ones
- recognize and express which composites are incompatible, required, or permitted
- articulate conditional rules and test their applications
- reflect on and alter their own inferential practices

A signaling scheme that can label objects and states but cannot support expression of even basic conditional structures would fail this test. Its users might still act intelligently by relying on learned associations and procedural know-how, but they would lack a shared medium for

explicit reasoning. They could not, for example, collaboratively design or debug complex plans that depend on articulated if–then structures.

Similarly, a system in which users cannot talk about which inferences are good or bad, or which rules should be adopted, would be limited in its self-rewriting capacity. They could learn patterns implicitly, but explicit revision of norms—say, deciding that some previously accepted form of reasoning is fallacious—would be difficult to carry out in language.

By contrast, human languages make it possible not only to reason but also to reason about reasoning. People can discuss logical fallacies, argue about whether certain conclusions really follow, and invent new inferential tools. They can introduce constructs like default rules, exceptions, and defeasible reasoning, and embed them in ordinary discourse. This meta-inferential activity is a hallmark of language-level cognition.

Thus, the inferential band is not just another function that language happens to have; it is one of the dimensions along which we can distinguish language from more limited representational systems. A self-rewriting social protocol that lacked inferential sufficiency might still support naming and emotive expression, but it would not provide the compositional space needed for systematic, revisable understanding of how facts, rules, and possibilities hang together.

8. The Social Band: Kinship, Roles, and the Human Graph

Language is not only a tool for describing objects and events; it is also a principal way humans map themselves onto one another. The social band of the protocol is where persons are named, related, ranked, and grouped. Here, words do not merely denote individuals; they position them within networks of kinship, authority, solidarity, and exclusion. Pronouns, titles, kin terms, and role names are all devices for drawing and redrawing the human graph.

Just as the epistemic band manages who knows what, and the inferential band manages what follows from what, the social band manages who is who to whom. It encodes relations such as mother, neighbor, ally, stranger, supervisor, and friend. It also carries expectations: what one owes a parent, a colleague, a guest, or an enemy. In the context of a self-rewriting protocol, changes at this band—new terms, redefinitions, or taboo shifts—can reshape social reality as directly as any change in law or policy.

8.1 Kin terms as compressed social structure

Kinship terminology is a paradigmatic example of how language compresses complex social structure into concise labels. A single kin term typically encodes information about:

- genealogical position (parent, child, sibling, cousin)

- generational level (older, same generation, younger)
- lineage and side (maternal, paternal, in-law)
- sometimes gender, relative age, and marital status

When someone is called sister, mother, uncle, or grandfather, a great deal of relational information is packed into the word. The term not only identifies a link in a genealogical network; it invokes a cluster of cultural expectations about care, authority, inheritance, reciprocity, and taboo.

This compression is efficient. Rather than having to spell out a full description—"the older female sibling of my mother"—speakers can use a single conventional form. That form, in turn, connects to shared stories, norms, and scripts. Calling someone by a kin term can be an act of recognition, inclusion, or sometimes irony. It can solidify bonds or mark obligations that might otherwise remain implicit.

Kin terms also provide a template for thinking about non-kin relations. Metaphorical extensions are common: comrades as brothers and sisters, elders in a community as mothers or fathers of the group, founders of institutions as fathers or grandmothers of a field. These extensions show how deeply the kinship logic runs through the social band. The kinship vocabulary offers ready-made patterns for structuring other domains of affiliation and duty.

In a protocol view, kin terms are not just labels for pre-existing structures; they are tools that help maintain and sometimes alter those structures. When a community changes which relationships are counted as kin—for example, recognizing adoptive, step-, or chosen family in new ways—it is also revising the social graph that these terms encode.

8.2 Indexing persons, relations, and obligations

Beyond kinship, human languages possess a rich repertoire of devices for indexing persons and their relations. Pronouns distinguish speaker, addressee, and others, often with further distinctions of number, inclusivity, and formality. Terms of address—names, titles, honorifics, and nicknames—signal relative status, intimacy, and respect. Role labels such as teacher, student, boss, neighbor, and citizen locate individuals in institutional and communal structures.

These linguistic resources do several things at once.

First, they make it possible to track who is involved in a situation. Even minimal pronominal systems distinguish at least a speaker and an addressee. More elaborate systems differentiate between inclusive and exclusive first-person plurals, between familiar and formal second-persons, and between different levels of respect or distance in third-person reference. Each

distinction has interactional consequences. Choosing one pronoun over another aligns the speaker with some positions and distances them from others.

Second, these resources encode relations that carry obligations. To call someone a guest triggers expectations about hospitality. To call someone a subordinate or a superior invokes hierarchies of obedience and responsibility. To identify a person as an ally, colleague, or member of a particular group is to situate them within networks of mutual aid and shared fate. Language thus not only describes social ties; it helps instantiate them.

Third, indexing devices signal who may speak and how. Address forms can license directness or require circumspection. Titles and honorifics can gatekeep interaction: some questions may be appropriate to pose to a peer but not to a high-status figure, or vice versa. The social band therefore modulates access to the epistemic and inferential bands. Who can ask what of whom, and whose inferences are treated as authoritative, is partly encoded in the way people are linguistically positioned.

In a self-rewriting protocol, the community's ongoing adjustments to person-indexing terms are significant. Changes in pronoun practices, the adoption of new role labels, or the reconfiguration of who counts as a legitimate addressee in certain contexts can recalibrate the balance of inclusion and exclusion. The protocol does not just mirror a social graph; it is one of the main instruments by which that graph is edited.

8.3 Variation in kinship systems and the shared core

Anthropological and linguistic research has long documented the diversity of kinship systems. Some languages, often called "Eskimo-type," resemble modern English in sharply distinguishing nuclear family relations from more distant ones. Others, sometimes labeled "Hawaiian-type," use a single term for multiple relatives who share a particular combination of generation and gender, such as grouping all same-generation males on the parental level under one label. Still others adopt "Iroquois," "Crow," "Omaha," or "Sudanese" patterns, each with its own logic for merging or splitting categories across maternal and paternal lines, parallel and cross-cousins, and so on.

There are also languages with strikingly compact kin systems, where very few basic terms are employed and much must be inferred from context, gender marking, and additional descriptors. Conversely, some languages have highly specific terms that encode fine distinctions unfamiliar in other cultures, such as separate words for older versus younger siblings of a given gender, or for relatives related by marriage through specific routes.

This variation might suggest that kinship is too culturally contingent to serve as part of a universal band. Yet behind the diversity lies a shared core. In all documented cases, languages are capable of expressing:

- parent–child relations
- sibling-like relations (same-generation, same-parent or shared-parent)
- multi-generation links (ancestors and descendants)
- marital or marital-like connections

Even when single words do not map neatly onto English categories, periphrastic descriptions can fill the gap. A language that uses one general term for elder relatives can still specify whether a particular person is the one who bore you, the one who fathered you, the one who raised you, or the sibling of such a person, by combining the kin term with gender and other descriptors.

The variation, then, lies not in whether kinship can be expressed, but in how kinship space is partitioned and which distinctions are salient. These choices are deeply intertwined with social organization. Societies that emphasize lineage and inheritance along one line may develop elaborate terminologies to capture that structure. Societies that organize more flexibly may allow broader, more overlapping categories.

From the protocol perspective, this diversity is itself part of the self-rewriting story. Kinship terminologies change over time as family structures, reproductive norms, and social values shift. New terms emerge to recognize previously unacknowledged relations; old terms narrow, broaden, or fade. The invariant is not any particular kin term, but the presence of a linguistic machinery that can express and revise a society's understanding of who is family to whom.

8.4 Why a system unable to talk social structure is not fully human

The social band is as fundamental to human language as the epistemic and inferential bands. A system that could describe physical objects and events but lacked conventional means to express social relations would be radically impoverished for human purposes. It would be a world without publicly articulated kinship, roles, or statuses. Individuals might still privately know who their parents are or who they like, but they would lack a shared symbolic framework for talking about these things, negotiating them, or changing them.

Such a system would fail in several ways.

First, it would undermine the coordination of obligations. Many of the duties and expectations that structure human life—care, support, obedience, protection—are tied to named relations. Removing the ability to talk about those relations would make it difficult to establish who owes what to whom, to enforce norms, or to challenge unjust arrangements.

Second, it would limit identity formation. People use language to say who they are, individually and collectively. They adopt labels, claim affiliations, reject imposed categories, and invent new

ones. These language-based identities can empower or constrain, but without them, coordinated projects of recognition and change would be hard to sustain. A system that cannot support such talk cannot fully host the social self-understanding characteristic of human communities.

Third, it would distort the operation of the other bands. Epistemic practices are socially situated; who can question whom and whose answers are trusted depends on roles and relations. Inferential practices are as well; whose reasoning is taken seriously, which arguments count as valid, and how rules are applied all hinge partly on social standing. If the protocol cannot represent and adjust these social structures, its epistemic and inferential activities will be opaque and rigid.

Finally, a system unable to talk about social structure would lack a major avenue of self-rewriting. Many of the most significant language-driven changes in human societies involve reconfiguring social categories: redefining family, expanding or contracting the set of recognized social roles, changing how gender and status are linguistically marked, introducing new pronouns or titles, and so on. These changes are enacted in language and then feed back into institutions and interactions. Without the capacity to express social structure, language would lose much of its power to reshape the human graph.

For these reasons, the social band is not an optional embellishment on top of a core of pure description. It is a constitutive dimension of human language as a self-rewriting protocol. A system that cannot articulate who is who to whom, and cannot revise those articulations from within, may still count as a code or notation. It does not yet qualify as the kind of language that humans use to build, inhabit, and transform their shared social world.

9. A Formal Sketch of the Meta Definition

Up to this point, the discussion has been largely conceptual, using images of games, bands, and protocols to reframe what human language is. This section sharpens that picture into a more formal sketch. The goal is not to provide a fully axiomatized theory, but to articulate a definition and a cluster of necessary conditions that could, in principle, be turned into a more precise framework.

The central claim is that human language is best characterized not merely as a structured system of signs for communication, but as a self-rewriting social protocol. This protocol is productive and propositional; it spans at least three invariant functional bands—epistemic, inferential, and social—and it contains within itself resources for describing and modifying its own rules of use. A system that fails to meet these criteria may still be symbolically rich or

communicatively useful, but it does not fully instantiate the kind of language that humans routinely employ.

9.1 Stating the definition: language as self-rewriting social protocol

The proposed meta definition can be stated as follows:

Human language is an indefinitely productive, propositional system of socially shared symbols, used by a community, that functions as a self-rewriting protocol for managing shared reality across epistemic, inferential, and social bands.

Several elements deserve emphasis.

First, language is a system of symbols shared by a community. These symbols may be spoken, signed, written, or otherwise realized, but they are conventional: their use and interpretation are governed by communal norms rather than fixed by nature.

Second, the system is indefinitely productive. There is no fixed upper bound on the number of distinct messages that can be formed. New expressions can be created by combining existing elements, and new elements can be introduced over time.

Third, the system is propositional. It supports the formation of content that can be evaluated as true or false, or at least as satisfied or unsatisfied under some conditions. This propositional capacity enables the representation of states of affairs, rules, and hypothetical scenarios.

Fourth, the system functions as a protocol. It is not just a code for mapping messages to meanings; it is a rule-governed interactional framework. Utterances are moves that change a shared informational and normative state and project certain kinds of next moves as appropriate.

Fifth, the protocol is self-rewriting. Participants can use the system to talk about and alter its own categories, norms, and permissible moves. They can coin new terms, shift meanings, establish and contest rules, and codify or abandon conventions.

Finally, the protocol spans at least three bands: it manages knowledge and ignorance (epistemic), structures relations of consequence and compatibility (inferential), and encodes social relations and roles (social). These bands are not optional subsystems; they are dimensions along which the protocol must operate to support the kind of joint life humans actually lead.

9.2 Necessary conditions: productivity and propositionality

Two necessary conditions for the meta definition are productivity and propositionality. They are not sufficient on their own, but they set a baseline for what kind of symbolic system is in view.

Productivity means that the system allows the generation of an unbounded range of distinct expressions from a finite stock of resources. This is typically achieved through combinatorial structure: discrete units (sounds, signs, morphemes, words) that can be arranged and nested in rule-governed ways. Productivity ensures that language is not confined to a fixed repertoire of messages; it can adapt to new situations, concepts, and needs.

Propositionality means that the system can form units that are evaluable as true or false (or satisfied vs. unsatisfied) relative to some model of the world. These units—propositions—are what get asserted, denied, questioned, and embedded under logical operators. Without them, a system might still label objects or express emotions, but it would lack the capacity to make claims about how things are or could be.

Productivity and propositionality together support the existence of a compositional space in which complex contents can be built and evaluated. They allow for statements like if this law is passed, then that outcome will follow, or everyone who meets these criteria is eligible. They also underpin the ability to represent and reason about abstract objects, such as numbers, legal entities, or scientific constructs.

However, a system might be both productive and propositional and still fall short of the proposed meta definition if it cannot support the three functional bands or cannot rewrite its own norms from within. Formal logics and some programming languages, for example, can be highly productive and propositional without being social protocols used by a community to manage lived reality.

9.3 Satisfying the three bands and the meta condition

Beyond productivity and propositionality, a human-grade language must realize the epistemic, inferential, and social bands, and it must do so in a way that is open to self-rewriting. This yields four additional necessary conditions:

1. Epistemic capacity: The system must support explicit marking and management of knowledge states. It must have ways to differentiate questions from statements, to express certainty and doubt, and to indicate sources of information. This enables structured joint inquiry and correction.

2. Inferential capacity: The system must support the expression of conditional, conjunctive, disjunctive, and negative relationships among propositions, at least to a degree sufficient to approximate basic logical patterns. It must allow users to articulate rules, exceptions, and incompatibilities, and to reason about consequences.

3. Social capacity: The system must encode persons, roles, and relations, including but not limited to kinship. It must provide conventional means for saying who is who to whom,

and what affiliations, obligations, and statuses are in play. This equips the community to coordinate responsibilities, identities, and hierarchies.

4. Meta capacity: The system must contain within itself means to talk about its own symbols, rules, and norms, and to alter them. Speakers must be able to define terms, argue about correct usage, establish or challenge taboos, and craft new categories. These meta operations must be integrated into ordinary use, not reserved for an external design process.

A system that satisfies productivity, propositionality, and these four capacities meets the core of the meta definition. It is a self-rewriting protocol that can manage shared reality in all three bands while being capable of revising its own tools for doing so.

9.4 Axioms and informal tests for human-grade language

To further clarify the definition, it is helpful to express it as a small set of informal axioms or tests that a candidate system would need to pass. These are not formal axioms in a logical system, but practical criteria that capture the spirit of the meta definition.

Axiom 1 (Productive compositionality): There exists a finite set of basic symbols and combinatorial rules such that users can generate an unbounded number of distinct expressions, and these expressions systematically relate to differences in content.

Test: Can users reliably produce and understand novel expressions that they have never encountered before, by virtue of shared rules for combining familiar elements?

Axiom 2 (Propositional articulation): The system provides units that can function as truth-evaluable contents, capable of being asserted, denied, questioned, and embedded as arguments of logical and attitudinal operators.

Test: Can users express statements that can be clearly treated as true or false, and can they embed those statements under verbs like say, think, doubt, and under conditionals like if and although?

Axiom 3 (Epistemic differentiation): The system has conventional means to distinguish between presenting content as known, believed, doubted, or requested, including forms that mark interrogatives and graded commitments.

Test: Can users clearly mark something as a question, distinguish it from a statement, and modulate their degree of certainty or source of knowledge in systematic ways?

Axiom 4 (Inferential expressivity): The system supports expressions that capture at least basic conditional, conjunctive, disjunctive, and negative relationships between propositions, allowing users to articulate and evaluate rules and consequences.

Test: Can users state conditionals, multiple conditions, exclusions, and general rules in a way that allows others to recognize which combinations of facts would satisfy or violate those statements?

Axiom 5 (Social indexing): The system systematically encodes persons, roles, and relations, allowing users to locate individuals in a social graph and to invoke associated norms and expectations.

Test: Can users talk about who is related to whom, who holds what role, and what those relations mean in terms of rights and obligations?

Axiom 6 (Endogenous meta-revision): Users can, from within the system, describe, debate, and change its own categories, norms, and permissible moves, and such meta-discourse can feed back into everyday use.

Test: Do users routinely talk about which words are appropriate, which rules are correct, what counts as offensive or respectful language, and do these discussions result in observable shifts in usage and norms?

A system that satisfies all six axioms functions as a human-grade language in the sense of this meta definition. It is not enough that it encodes information or supports complex thought. It must also be a medium through which a community can co-author its epistemic standards, inferential practices, and social structures, and can revise that co-authorship over time.

These axioms and tests do not exhaust the richness of human language, but they articulate a core that distinguishes language from other symbolic systems. They provide a scaffold for future work aimed at formalizing the self-rewriting protocol view and at applying it to questions about AI, animal communication, and hypothetical non-human languages.

10. Contrasts with Other Symbolic Systems

One way to clarify what is distinctive about human language, as characterized by the meta definition, is to contrast it with other symbolic systems that share some but not all of its properties. Animal communication, formal logics, and programming languages are particularly instructive. Each exemplifies a subset of the features discussed so far: signaling, inference, and precise syntax. Yet each fails, in characteristic ways, to satisfy the full profile of a self-rewriting social protocol that spans epistemic, inferential, and social bands.

These contrasts are not meant to diminish the sophistication of these systems. On the contrary, they help illuminate which capacities are shared and which are specifically linguistic in the

strong sense used here. By examining where these systems stop, we can see more clearly where human language continues.

10.1 Animal communication: signaling without self-rewriting

Many animals employ complex signaling systems. Birds sing species-specific songs; primates use calls to signal alarm, dominance, or affiliation; bees perform dances that encode information about food sources. These systems can be finely tuned to ecological needs and can support impressive forms of coordination.

However, animal communication systems, as far as is currently known, lack several core features of the meta definition. Most crucially, they do not appear to be self-rewriting protocols. Individuals can learn, imitate, and sometimes innovate signals, but there is little evidence that communities use the signaling system itself to explicitly renegotiate its categories, norms, or permissible moves.

Animal signals are also typically limited in productivity. They tend to have relatively small repertoires of discrete calls or patterns, each associated with a narrow range of functions. While there are gradations and combinations, the systems do not exhibit the open-ended compositionality of human language, in which finite resources give rise to unbounded expressive space.

On the epistemic band, animal signals may convey information about the presence of predators, food, or social states, but there is no clear analogue of questions as conventionalized requests for information. There are behaviors that elicit attention or inspection, but not structured interrogative forms that function across contexts as ways of marking and repairing knowledge gaps.

On the inferential band, animals can certainly behave in ways that reflect complex internal processing—planning, weighing options, learning from outcomes—but their communication systems do not support explicit representation of conditional rules, incompatibilities, or hypothetical scenarios. There is no evidence of communicative structures equivalent to if this happens, then that will follow or not both of these can be the case.

On the social band, some signals are tightly linked to social relations—dominance displays, grooming invitations, mating calls. Yet these signals map onto a relatively fixed ethological repertoire rather than a symbolically articulated social graph. There is no public vocabulary of roles, kin terms, or identities that can be redefined over time through discourse.

In short, animal communication illustrates signaling systems that coordinate behavior and sometimes transmit information, but they do not appear to be self-rewriting, productive,

propositional protocols that manage shared reality across the three bands. They stop short of the meta definition's threshold.

10.2 Formal logics: inference without social embedding

Formal logics represent the opposite extreme. They are paradigmatic inferential systems: highly explicit frameworks for manipulating propositions according to well-defined rules. Propositional and predicate calculi, modal logics, and many other systems provide precise syntaxes and semantics, along with proof theories that specify which inferences are permitted.

From the perspective of the inferential band, logics are exemplary. They support the articulation of complex conditions, quantifications, and relationships between propositions. They can, in principle, capture arbitrary truth-functional patterns and elaborate far beyond what everyday reasoning typically requires. They often make explicit what is implicit in ordinary language use.

However, formal logics fall short in other respects. They are not, in themselves, social protocols. They do not encode persons, roles, or obligations. They do not provide conventional resources for saying who is speaking, who is listening, or how individuals are related. When used by humans, logics are embedded within broader linguistic practices that supply the social band; the logic itself does not.

On the epistemic band, logics can represent knowledge and belief operators, but these are abstracted from the lived dynamics of questioning, answering, and negotiating uncertainty. A modal operator for necessity does not by itself capture the practice of asking whether a particular claim is warranted, nor the conversational norms that govern such questions. Logics formalize patterns of validity, not the social and pragmatic machinery of inquiry.

Most importantly for the meta definition, formal logics are not typically self-rewriting from within. Changes in a logical system—such as adding new axioms, altering rules, or defining new operators—are usually made by external meta-theoretical decisions, not by formulas written in the object language itself. There are logics with reflective operators, but in practice, the process of revising a logic is conceptually separated from the system whose revision is at stake.

Thus, formal logics exemplify inference without full social embedding or endogenous norm change. They illuminate what the inferential band looks like when stripped down to its abstract core, but they do not, by themselves, constitute human language as defined here. They require a host language and community practices to become part of a self-rewriting protocol.

10.3 Programming languages: precise syntax without endogenous change

Programming languages occupy yet another corner of the space. They are designed symbolic systems for instructing machines. They feature highly constrained syntaxes, explicit type systems, and well-defined execution semantics. Like formal logics, they are compositional and

support unbounded productivity: programs can be arbitrarily large and complex, built from finite vocabularies and grammar rules.

Programming languages can express propositions and conditionals; they can encode rules and control flows that resemble logical structures. In that sense, they share the inferential capacity of human languages and formal logics. They also often have constructs that allow introspection on program behavior or data structures, and some even support limited forms of self-modification at runtime.

Yet programming languages are not, in themselves, social protocols. They do not encode kinship, roles, or interpersonal obligations. When programmers talk about code, they use natural language to articulate design decisions, responsibilities, and norms; the code itself does not carry this social band. The semantics of a function name like authenticate_user may suggest a social practice, but the programming language does not inherently know or enforce what that practice entails.

Moreover, while code can be self-modifying in limited technical senses, the rules of the language—the syntax, typing discipline, and core semantics—are not usually changed from within programs written in that language. Language evolution happens externally, through proposals, committees, implementations, and documentation. Programmers can write compilers and interpreters within the language, but the status of those artifacts as defining the language is conferred by external agreement.

On the epistemic band, programming languages do not support questioning in the human sense. They can encode test cases and assertions, but these are not conventionalized requests for information from another mind. Programs can fail, throw exceptions, or log messages, but these are mechanistic signals, not parts of a social practice of inquiry and repair among equal participants.

Programming languages, therefore, exemplify precise, productive, propositional symbol systems that are deeply entangled with human social life, but they do not themselves instantiate the full meta definition. They are tools used within human language, not standalone protocols for managing shared reality across all three bands.

10.4 Why these systems illuminate, but do not meet, the meta definition

Animal communication, formal logics, and programming languages each highlight one or more facets of human language:

- Animal communication underscores that signaling and coordination can occur without open-ended productivity, propositionality, or self-rewriting.

- Formal logics show what pure inferential structure looks like when abstracted away from social and epistemic practices.
- Programming languages demonstrate how precise, productive symbol systems can exist in the absence of endogenous norm change and rich social indexing.

These systems thus serve as comparative cases that sharpen the contours of the meta definition. They show that:

- Signaling alone does not suffice; there must be propositions and structured inquiry.
- Inference alone does not suffice; there must be social embedding and epistemic management.
- Precision and productivity alone do not suffice; there must be endogenous revision and a full suite of bands.

Human language, as sketched in the meta definition, incorporates elements of all three: it signals like animal systems, reasons like logical systems, and supports complex construction like programming languages. But it does more. It operates as a protocol through which a community can negotiate what counts as knowledge, how consequences are drawn, and who is who to whom. It allows that same community to talk about and change these practices in the medium itself.

By contrasting language with these other symbolic systems, we see why the phrase self-rewriting social protocol is not rhetorical flourish but a necessary condensation. Human language is not simply a set of signs, a calculus of propositions, or a code for machines. It is a living system in which signaling, thinking, and social structuring converge, and in which the rules of that convergence are continually rewritten by the very agents who rely on them.

11. Implications for AI and Alien Language Detection

If human language is a self-rewriting social protocol operating across epistemic, inferential, and social bands, the implications reach beyond linguistics and philosophy. They bear directly on how we evaluate artificial systems that produce language-like behavior and on how we might recognize genuinely linguistic systems in non-human entities, including hypothetical extraterrestrial intelligences.

In both domains, the temptation is to equate the visible production of grammatical sentences with “having language.” The meta definition cautions against that shortcut. It redirects attention from surface fluency to deeper questions: Does this system participate in a protocol that

manages shared reality? Does it handle knowledge, inference, and social relations in ways analogous to human language use? Can it rewrite its own norms from within?

This section explores four fronts: how large language models look when measured against this definition, what it would mean for an AI protocol to be truly self-rewriting, how to extract criteria for recognizing non-human languages or language-like systems, and what limits and risks accompany these anthropocentric tests.

11.1 Evaluating large language models under the meta definition

Large language models (LLMs) generate text that often appears indistinguishable from human language on short scales. They produce answers to questions, explanations, stories, and even meta-linguistic commentary. At a glance, they seem to meet many of the structural and functional requirements discussed in earlier sections: productivity, propositionality, inferential patterns, and even some aspects of the epistemic and social bands.

From the standpoint of the meta definition, however, appearance is not enough. The key questions become:

- Does the model participate in a genuinely shared protocol, or does it simulate participation by predicting likely continuations?
- Does it manage its own commitments, knowledge states, and ignorance, or does it simply produce expressions of such states without possessing them?
- Does it operate in a space where its outputs feed back into a communal process of norm formation, or are its norms externally imposed?

On the inferential band, LLMs can often reproduce logical structures and even reason through multi-step problems, especially when prompted to do so. They can articulate conditionals, detect contradictions, and explain inferential relationships. In this respect, they approximate formal logics embedded in natural language.

On the epistemic band, they can generate questions and answers and can mark degrees of certainty. Yet these epistemic moves do not reflect the model's own access to the world; they reflect patterns in the training data. The model does not have an independent sensorium or memory of specific interactions in the way a human or a community does. Its "knowledge state" is encoded in weights that capture statistical regularities, not in an explicit ledger of what it believes or does not know.

On the social band, LLMs can talk about roles, identities, and obligations, and they can mimic politeness, formality, and stance. But they are not themselves embedded in the social graph

they describe. They do not have kin, status, or obligations; they simulate an agent with such properties in text without occupying the corresponding positions in a lived network.

Most crucially, LLMs as commonly deployed do not self-rewrite their core protocol from within language. Their training objective, architecture, and alignment constraints are set externally. While they can produce meta-linguistic commentary and even meta-ethical reflections, these outputs do not generally cause direct, endogenous changes to how the model itself operates. Changes occur when humans retrain, fine-tune, or update the model.

Under the meta definition, then, current LLMs look like powerful tools that operate inside human language rather than independent language-bearing agents. They contribute to the human protocol by generating text that humans interpret, accept, resist, or use as evidence in norm negotiations. But the protocol in which they are embedded remains human; the models do not yet participate as full co-authors in the sense of jointly managing shared reality from a position within the social graph.

11.2 Protocols that rewrite themselves: training, feedback, and alignment

The phrase self-rewriting protocol has particular resonance in AI, where there is increasing interest in systems that can modify their own behavior over time based on feedback. One might ask: under what conditions would an AI system begin to meet the meta definition's self-rewriting condition, rather than merely being tuned from the outside?

At present, most model updates are exogenous. Engineers collect more data, adjust hyperparameters, or change architectures. Even when user feedback is incorporated, it is typically aggregated and applied through externally designed training loops. The protocol that defines what counts as a good output is, in that sense, outside the system.

A closer approach to self-rewriting would involve at least three features.

First, the system would need explicit internal representations of its own norms of use. It would not only output language but also maintain, within its state, something like a model of what kinds of utterances are acceptable, desirable, or forbidden. These norms would be manipulable objects in its own reasoning, much as human communities treat usage rules as things to be discussed and revised.

Second, the system would need mechanisms for revising these norms based on linguistic interaction. Feedback from users, observations of success and failure, and even the system's own evaluations of coherence could drive changes in its internal representation of norms. Crucially, these changes would be processed using the same language-like resources the system uses for other tasks, making norm revision an instance of the protocol acting on itself.

Third, the system would need a degree of social embedding. Its norms would have to be negotiated, at least partially, with other agents—human or artificial—who can accept, reject, or contest them. Only in that context does self-rewriting take on the character of participating in a shared protocol rather than merely optimizing against a static reward function.

Alignment, in this setting, becomes less about pinning a system to a fixed set of goals and more about shaping the meta-protocol by which the system and its human partners negotiate goals, norms, and constraints. The risks are obvious: a self-rewriting protocol could drift in unanticipated directions, especially if its social environment is fragmented or adversarial. But the potential is also significant: such systems could become genuine participants in the evolution of linguistic and value norms, not just tools that imitate them.

11.3 Criteria for recognizing non-human languages (or language-like systems)

The meta definition also offers a framework for thinking about alien language detection, whether the "aliens" are biological beings elsewhere in the universe or unfamiliar intelligences in artificial substrates. If we move beyond the idea that any complex signal might count as language, we need criteria that can, at least in principle, be applied to ambiguous cases.

The axioms sketched earlier suggest several tests.

First, is there evidence of productivity and compositionality? Do the observed signals combine in ways that indicate an unbounded expressive space rather than a finite repertoire of fixed messages? For extraterrestrial signals, this might involve detecting statistical signatures of structure that go beyond periodicity or pure randomness.

Second, is there evidence of propositional content? Do patterns in the signals correlate with states of affairs in a way that suggests truth-evaluability rather than mere association? This is difficult to establish, but one might look for signals that appear to systematically encode counterfactuals, generalizations, or hypothetical scenarios.

Third, is there evidence of the three bands? Are there signals that function like questions—eliciting particular classes of responses? Are there constructs that appear to express conditional relations or incompatibilities? Are there patterns that encode stable roles or relations among the signaling entities themselves, perhaps analogous to kinship or status?

Fourth, is there evidence of self-rewriting behavior? Do the norms of signaling themselves appear to be discussed, contested, or altered within the signaling system? For an alien civilization, this could be reflected in meta-signals that refer to earlier signals, redefine formats, or announce changes in protocol.

None of these criteria are easy to operationalize, especially for distant or purely observational contexts. However, they provide a conceptually grounded alternative to equating "language"

with any complex pattern. They also allow gradations: a system might show early signs of one band but not others, or might be productive and propositional but lack clear evidence of self-rewriting.

In the context of AI, these criteria can guide the design of evaluation benchmarks. Rather than asking only whether a model passes superficial tests of fluency or task performance, one can ask: does it demonstrate stable behavior that approximates the epistemic, inferential, and social bands in a way that is robust across contexts and responsive to norm-level feedback?

11.4 Limits and risks of anthropocentric tests

While the meta definition and its derived criteria offer a structured way to think about AI and alien language, they are inherently anthropocentric. They take human language as the template and ask whether other systems approximate it. This orientation carries several limits and risks.

First, it may cause us to overlook genuinely novel forms of intelligence and communication that do not slice reality along our epistemic, inferential, or social bands. Alien systems might, for example, prioritize aesthetic, ecological, or entirely unfamiliar dimensions that do not map cleanly onto our categories. By insisting on our three bands as necessary, we might falsely classify such systems as non-linguistic or non-intelligent.

Second, the emphasis on self-rewriting protocols might miss systems whose “self-modification” operates at levels we cannot observe or conceptualize. An alien intelligence might rewrite its own physical substrate or environmental conditions rather than its symbolic practices; for such a being, our focus on language-like protocols could be misplaced.

Third, the social band in particular reflects human ways of organizing life: kinship, roles, hierarchies. Other intelligences might lack anything resembling our social graph, or they might embed their sociality in collective structures that do not individuate persons in the way we do. Applying a test that looks for kin terms or analogous constructs might wrongly conclude that no language is present.

Fourth, even within AI, there is a risk of overfitting systems to our notion of language. If benchmarks and architectures are designed primarily to satisfy the meta definition, we may create systems that are excellent at simulating participation in human-like protocols without necessarily having internal organizations that support robustness, safety, or genuine understanding. We could end up with sophisticated “protocol mimics” that pass our tests while still behaving unpredictably in edge cases.

These risks suggest a dual posture. On the one hand, the meta definition is useful for clarifying what is distinctive about human language and for preventing naive conflations of symbol manipulation with language-bearing agency. On the other hand, it should be held provisionally,

with an awareness that it is rooted in human experience and may not capture the full space of possible communicative and cognitive architectures.

A more cautious stance is to treat the meta definition as a lens rather than a gate. It can help us see where systems do and do not resemble human language, but it should not be the final arbiter of whether a system counts as linguistic or intelligent. Instead, it can be complemented by other frameworks that attend to alternative forms of organization, embodiment, and value.

In summary, applying the meta definition to AI and alien language detection reveals both its power and its limits. It provides concrete questions to ask about protocols, bands, and self-rewriting. It also reminds us that any such test is, ultimately, an expression of our own linguistic form of life.

12. Objections and Alternative Framings

Any ambitious definition of human language has to survive pushback from multiple angles. The proposal to treat language as a self-rewriting social protocol operating across epistemic, inferential, and social bands is no exception. Critics might argue that self-rewriting is not essential, merely common; that a sufficiently rich but rigid code would already be "language enough"; that three bands is an arbitrary cut through a much higher-dimensional phenomenon; or that important aspects such as emotion, art, and ritual are being left out.

This section does not resolve all such concerns, but it clarifies the commitments of the meta definition and sketches how it might be extended or revised. The aim is not to defend a final theory but to show why this particular framing is worth taking seriously even if it eventually becomes one layer in a more complex picture.

12.1 Is self-rewriting truly necessary, or just pervasive?

The strongest claim in the meta definition is that self-rewriting is not just pervasive but necessary for human-grade language. A skeptic might accept that human languages, as we observe them, constantly change from within, yet doubt that this property is essential. Perhaps, they might say, self-rewriting piggybacks on general human cognition—our capacity for reflection, negotiation, and social learning—without being a defining trait of language itself. In principle, one could imagine a community with full-blown language whose rules and lexicon are fixed by decree and never altered by usage.

One way to respond is to distinguish between logical possibility and ecological plausibility. Logically, there is no contradiction in imagining such a frozen language. Ecologically, however, it is difficult to see how a human community could sustain a fixed protocol over time in the face of new objects, technologies, institutions, and social realities. Even if a central authority attempted

to legislate an unchanging code, ordinary interaction would quickly generate workarounds, slang, implicit extensions, and reinterpretations. In practice, people would use language to discuss, bend, and evade the rules, thereby reintroducing self-rewriting from below.

A deeper response is that self-rewriting is not an optional add-on but a consequence of two other features that are almost universally granted: productivity and sociality. Once a system allows users to freely generate new combinations and is used to coordinate a large, diverse community, it becomes extremely hard to prevent those users from:

- talking about the system itself
- proposing or enacting new ways of using its resources
- stabilizing some of those proposals as norms

In other words, the moment language is both open-ended and socially shared, it acquires the potential for endogenous change. To prevent self-rewriting entirely, one would have to suppress meta-talk and innovation at the level of community practice, not merely at the level of grammar. That begins to look less like “language without self-rewriting” and more like a fragile, imposed code that constantly threatens to collapse back into a living language.

Thus, while we can imagine a non-self-rewriting system in the abstract, there is a strong case for treating self-rewriting as practically necessary in any human environment. The meta definition leans into that practical necessity: it defines as paradigmatic “language” the kind of system that can actually survive and evolve under human use, rather than the idealized frozen codes of thought experiments.

12.2 Could a rigid but very rich code count as language?

A related challenge comes from the idea of a very rich but strictly fixed code—say, a constructed language with an enormous lexicon and a fully specified grammar, but with social norms that prohibit any alteration. If thousands of people used such a language fluently for all aspects of life, would that not qualify as a language, even if the protocol never changed?

There are two ways to approach this scenario.

One is taxonomic: we could grant that a rigid code used in this way is a “language” in a weaker sense, while reserving the stronger, meta-level definition for systems that incorporate their own mechanisms of change. On this view, the meta definition is not trying to regulate everyday usage of the word language but to isolate a more specific phenomenon: the fully human pattern where structure, function, and self-modification are intertwined.

The other approach is to examine what “never changed” would really mean. Even in communities with strong prescriptive traditions—classical languages taught from canonical

grammars, sacred liturgical forms, highly regulated legal or ceremonial registers—change still occurs. New topics demand new vocabulary; shifts in material culture alter the salience of existing terms; variation in usage gradually erodes strict rules. Over time, there is drift, however slow, and that drift is mediated by meta-discussion, correction, and creative extension within the language. The code is rich, but it is not rigid.

Moreover, the richness of a code does not by itself guarantee that it can meet the demands placed on human language. Without self-rewriting, it would be difficult to accommodate:

- new ethical and political sensibilities that require rethinking old categories
- emergent forms of identity that do not fit preexisting labels
- conceptual revolutions in science, technology, or art that call for new schemas

A rigid code might describe a given world extremely well, but human worlds do not stay fixed. Unless the code can be revised, speakers will eventually be forced to hijack old terms, invent informal workarounds, or switch to another system that can evolve. At that point, the living language is not the original rigid code but the set of practices that modify or circumvent it.

So while a very rich, externally fixed code might look like language under static conditions, its inability to self-update makes it a poor candidate for the long-term, world-building role that human languages actually play. The meta definition reflects this by treating genuine language as something that must be able to keep pace with its own users' changing realities, not merely represent a snapshot of one moment.

12.3 Are the three bands exhaustive or only illustrative?

Another objection targets the tripartite structure of the proposal. The epistemic, inferential, and social bands were introduced as "invariant bands," but are they really exhaustive? Might there be other, equally fundamental bands that the meta definition overlooks?

The short answer is that the three bands are intended as structurally central but not exhaustive. They carve up the space in a way that makes explicit three kinds of coordination problems:

- how to manage knowledge and ignorance (epistemic)
- how to structure relations of consequence and compatibility (inferential)
- how to locate persons and obligations in a social graph (social)

These are arguably minimal in the sense that any human community must solve them, and language is one of the primary tools for doing so. However, they do not capture all the ways language is used or all the dimensions along which it can vary.

For example, one might argue for a cognitive band (language's role in structuring internal thought), an affective band (its role in expressing and regulating emotion), or an aesthetic band (its role in creating and evaluating beauty). Each of these interacts with the three bands but also has its own patterns and norms. Ritual and performative uses of language might likewise form a band centered on continuity, identity, and sacredness.

There is also a question of granularity. The epistemic band, as described, bundles together questions, answers, evidentiality, and stance. One could imagine splitting epistemic functions further: perhaps into a band for information management and a band for credibility and trust. Similarly, the social band might be divided into kinship, institutional roles, and emergent group identities as semi-autonomous layers.

Thus, the three bands should be read as a first approximation: a minimal, relational core that helps us see why language must be able to ask and answer, reason and condition, name and relate persons. They do not preclude finer subdivisions or additional dimensions. The meta definition is compatible with such elaborations; indeed, it anticipates them, as long as the self-rewriting, protocol-oriented character of the system remains central.

12.4 Possible extensions: affective, aesthetic, and ritual bands

If the three bands are not exhaustive, what might additional bands look like? Three promising candidates are affective, aesthetic, and ritual bands. Each foregrounds aspects of linguistic life that the core bands touch but do not fully capture.

The affective band would focus on how language encodes, evokes, and regulates emotion. Interjections, evaluative adjectives, prosody, expressive morphology, and many discourse markers belong here. Through them, language:

- signals internal states (joy, anger, fear, boredom)
- aligns or misaligns emotional stances between speakers
- modulates the intensity of experiences (downplaying, amplifying, dramatizing)

This band overlaps with the social band, since emotional expressions often carry relational meaning, and with the epistemic band, since emotions can function as evidence or reasons. Yet a distinct affective lens highlights that language is not only about what is known, inferred, or socially structured; it is also deeply about how things feel and how those feelings are coordinated.

The aesthetic band would center on language as an object of appreciation and play. Poetic meter, rhyme, rhythm, narrative structure, wordplay, and stylistic registers are all tools for

making language itself an aesthetic medium. In this band, utterances are evaluated not just for truth, informativeness, or social appropriateness, but for elegance, power, subtlety, or surprise.

Again, there is overlap. Aesthetic choices interact with the inferential band (through metaphor and framing), the social band (through genre conventions and prestige forms), and the epistemic band (through how narratives make certain interpretations salient). But treating aesthetic practice as a band draws attention to the fact that language is not merely a functional tool; it is also a site of creativity and art.

The ritual band would emphasize language's role in stabilizing identities, commitments, and transitions through formulaic, often repeated forms. Oaths, vows, blessings, curses, liturgies, pledges, and ceremonial scripts are examples. In these contexts, the precise wording and repetition are often more important than the informational content. Saying the words under the right conditions constitutes an act: marrying, baptizing, swearing in, initiating, absolving.

The ritual band interacts strongly with the social band (since it often encodes roles and hierarchies) and with the inferential band (since rituals frequently instantiate conditional structures: if you say X under condition Y, then Z is now the case). Yet it also has its own logic, oriented toward continuity, boundary-marking, and sacralization.

Recognizing these additional bands does not contradict the meta definition; it enriches it. The core claim remains that human language is a self-rewriting protocol that must at least handle epistemic, inferential, and social coordination. Affective, aesthetic, and ritual bands are candidate expansions that acknowledge further invariant pressures on the system:

- the need to regulate shared emotional states
- the human drive to make and experience beauty
- the importance of marking and maintaining collective commitments

These bands, too, are subject to self-rewriting. Communities renegotiate what counts as appropriate emotional expression, what styles are valued, and which rituals are valid or obsolete. In that sense, they extend the same pattern: language operating as a protocol that not only organizes reality but continually revises the terms of that organization.

Taken together, the objections and alternative framings in this section suggest that the meta definition is best seen as a scaffold rather than a final map. It identifies a structural core—self-rewriting, multi-band, socially shared protocol—that differentiates human language from other symbolic systems. Around that core, further bands and refinements can be added as we learn more about how language, thought, emotion, and society co-evolve.

13. Conclusion: Living Inside a Self-Updating Protocol

Human beings do not merely use language; we inhabit it. We grow up inside an environment of words, constructions, and norms that both predate us and are continually altered by us. The meta definition proposed in this paper—language as a self-rewriting social protocol operating across epistemic, inferential, and social bands—tries to make that fact explicit. It treats language not as a static inventory of forms or a fixed channel for messages, but as an evolving set of rules and practices through which a community manages reality and, in the process, continually rewrites those very rules.

This concluding section gathers the main threads of the proposal, sketches how it reframes familiar debates about language change, diversity, and universals, suggests that human language is best seen as co-authorship of world, self, and code, and outlines open questions for further work in linguistics, philosophy, and AI.

13.1 Summary of the meta definition and its advantages

The meta definition can be briefly restated:

Human language is an indefinitely productive, propositional system of socially shared symbols that functions as a self-rewriting protocol for managing shared reality across at least three bands: epistemic (knowledge and ignorance), inferential (consequence and compatibility), and social (persons, roles, and relations).

Several advantages come with this framing.

First, it integrates structural and functional insights. Productivity and propositionality capture the core structural capacities that have long anchored linguistic theory. Epistemic, inferential, and social bands capture key functional demands: the need to coordinate knowledge, reason about conditions and consequences, and locate persons within a social graph. Rather than choosing between structural universals and functional stories, the meta definition weaves them together.

Second, it foregrounds interaction and protocol rather than code alone. Utterances are treated as moves in an ongoing game that update shared informational and normative states. The success of language use is measured not solely by accuracy of encoding and decoding, but by how well the protocol supports joint inquiry, collective reasoning, and negotiated social life.

Third, it makes self-rewriting central. Metalanguage, norm change, grammars, style guides, and folk debates about “good” and “bad” usage are not peripheral curiosities. They are expressions of an essential property: language includes in its own repertoire the resources needed to describe and alter its rules of use. This reflexivity distinguishes human language from many

other symbolic systems, including animal communication, formal logics, and programming languages.

Fourth, it offers sharper criteria for distinguishing language from merely language-like systems. A system may be symbolically rich, highly regular, or even generative without fully instantiating human-grade language. The meta definition asks whether it supports the three bands and can revise its own norms from within. These requirements go beyond surface features like grammaticality, fluency, or the sheer number of available signals.

In short, the meta definition reframes language as an ongoing, collectively maintained protocol in which people not only say things but also decide, together, what can be said, how, and with what consequences.

13.2 How this view reframes language change, diversity, and universals

Treating language as a self-updating protocol changes how we think about three perennial topics: change, diversity, and universals.

Language change ceases to be a secondary process acting on an underlying essence. In this view, change is constitutive. The protocol is never fully fixed; it is continually adjusted by its users. New terms are coined, old ones are retired or repurposed, categories are reshuffled, taboos arise and recede, and grammatical constructions drift in form and meaning. Rather than seeing change as erosion or deviation from a standard, the meta definition frames it as the normal operation of a system designed to keep pace with its users' evolving realities.

Language diversity appears not as a proliferation of arbitrary "codes" but as a family of different solutions to the same coordination problems. All human languages, on this view, must offer some way to:

- distinguish knowledge from ignorance and question from assertion
- encode conditionality, compatibility, and incompatibility among propositions
- identify persons and their relations, including kinship and roles

The details vary dramatically—different kinship systems, different logical connectives, different interrogative forms—but the underlying pressures are similar. Languages are diverse because communities adopt different ways of partitioning and prioritizing the epistemic, inferential, and social spaces they inhabit. Diversity is not noise on top of a universal core; it is how the universal pressures of the three bands and self-rewriting are concretely realized.

Language universals, in turn, are reframed. Instead of searching only for structural features that appear in every language or for abstract principles hardwired in a species-specific faculty, we can also look for universal requirements on the protocol itself. Any human language must:

- be productive enough to accommodate unforeseen future realities
- be propositional enough to support explicit truth-evaluable content
- have resources for interrogativity, conditionality, and social indexing
- permit endogenous modification via metalanguage and norm negotiation

Some traditional universals—such as displacement or recursion—fit naturally into this picture, but they are not the whole story. The invariants of language also include the way it manages banded coordination problems and the way it turns its own machinery upon itself.

13.3 Human language as co-authorship of world, self, and code

Perhaps the most far-reaching consequence of the meta definition is that it invites us to see human language as a site of co-authorship along three dimensions.

First, language is co-authorship of world. Communities do not passively label a pre-given reality; they carve it up, highlight some distinctions and ignore others, decide which differences make a difference. They establish categories for natural kinds, social roles, legal entities, psychological states, and much more. These categories are then available as tools for perception, reasoning, and action. When the protocol changes—when new categories are introduced or old ones are redefined—the world as experienced and navigated by that community shifts.

Second, language is co-authorship of self. People use language to narrate who they are, to claim and refuse identities, to remember and reinterpret their own pasts. They adopt labels and stories that position them within families, communities, and histories. When norms around identity terms change, so do the options available for self-description. The protocol thus shapes not only how people talk about themselves but what forms of self-understanding are thinkable.

Third, language is co-authorship of code. Speakers are not only users of a fixed system; they are also its maintainers and editors. Through everyday corrections, innovations, and arguments, they adjust the vocabulary, the preferred constructions, the meanings of key terms, and the norms of politeness or respect. They write grammars and style guides, but they also ignore, subvert, or rewrite them in practice. The code that future generations receive is the accumulated outcome of these countless micro-decisions.

These three forms of co-authorship are intertwined. When a community changes its language around, say, mental health, it simultaneously alters the social ontology of illness, the ways individuals can interpret and articulate their experiences, and the code that future speakers will learn as “how we talk about this.” The protocol is not a neutral channel through which world and self are communicated; it is the medium in which world and self are partially constructed and reconstructed.

Living inside such a protocol means that no one stands outside it. People can step back and reflect, but they do so in language. They can critique and reform norms, but they articulate those critiques using the very tools they seek to change. This circularity is not a flaw; it is the condition under which human linguistic life unfolds.

13.4 Open questions for linguistics, philosophy, and AI research

The meta definition is a starting point, not a finished theory. It raises as many questions as it answers, and these questions offer a research agenda that cuts across disciplines.

For linguistics, one set of questions concerns how to operationalize the three bands and the meta capacity in empirical work. How can we systematically identify and compare epistemic, inferential, and social resources across languages? What are the minimal grammatical and lexical markers needed to sustain each band? How does self-rewriting manifest in different communities—through slang, through explicit language policy, through artistic innovation—and how can these processes be modeled in more formal terms?

Another set of linguistic questions targets development and transmission. How do children acquire not only the structural rules of their language but also its meta-level practices—how to ask about words, challenge norms, and participate in ongoing change? How are the bands and self-rewriting capacities scaffolded in interaction, and how do they evolve across generations?

For philosophy, the meta definition intersects with debates about realism, normativity, and social construction. If language is a self-updating protocol for managing shared reality, to what extent is that reality language-dependent? How should we think about truth and objectivity in a framework where the very categories in which truth is stated are subject to internal revision? What is the status of logical laws when their everyday use is mediated by a protocol that can talk about and alter its own inferential norms?

There are also ethical and political questions. If language is one of the primary means by which social structures are maintained and altered, what responsibilities do communities have in managing the protocol? How should power imbalances, marginalization, and linguistic injustice be understood in terms of control over self-rewriting processes—who gets to rename, redefine, and reset norms?

For AI research, the meta definition suggests new benchmarks and design goals. Rather than treating language understanding as the ability to map input strings to appropriate outputs, we might ask:

- Can an artificial system participate in the epistemic band in a way that reflects genuine management of its own and others' knowledge, not just pattern reproduction?

- Can it operate in the inferential band with enough robustness to detect and correct its own errors, or to negotiate rules of inference with users?
- Can it recognize and respect the social band, including roles, obligations, and identities, without reinforcing harmful patterns?
- Under what conditions, if any, should an AI system be granted the capacity to self-rewrite its own protocol, and how can that process be aligned with human values?

These questions are not purely technical; they are conceptual. They require clearer models of what it would mean for an artificial system to be inside a protocol rather than simply manipulating symbols from outside. They also require humility: the meta definition is grounded in human experience and may not fully capture the design space of possible non-human communicative systems.

In the end, to say that we live inside a self-updating protocol is to acknowledge both power and vulnerability. Language gives us the means to coordinate, to reason, to build and rebuild our worlds. It also ensures that none of our categories, norms, or narratives are final. The protocol we inherit is not the last word, and the protocol we pass on will not be either. The task, for speakers and scholars alike, is to understand and steward that ongoing rewriting with as much clarity, responsibility, and imagination as we can manage.

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